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A REPORT ON
FREEWAYS AND MAJOR STREETS
IN
OAKLAND, CALIFORNIA

Prepared For
The City Council
of
THE CITY OF OAKLAND
California

HARLAND BARTHOLOMEW AND ASSOCIATES
CITY PLANNERS
ST. LOUIS, MISSOURI
JULY, 1947

A UNIT OF THE OAKLAND MASTER PLAN

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HARLAND BARTHOLOMEW AND ASSOCIATES
CITY PLANNERS · CIVIL ENGINEERS · LANDSCAPE ARCHITECTS
317 NORTH ELEVENTH STREET
SAINT LOUIS 1. MISSOURI

HARLAND BARTHOLOMEW
RUSSELL H. RILEY
HARRY W. ALEXANDER
ELDRIDGE LOVELACE

November, 1947

City Planning Commission
Oakland, California

Gentlemen:

Submitted herewith is a Report on Major Streets and Freeways for the Oakland Area. This is the third of the four reports to be prepared in accordance with our agreement with the City of Oakland.

The accompanying report contains an analysis of the existing street and highway system, a program of street and freeway improvements to be made within the next ten years, and a major street and freeway plan designed for accomplishment by 1970.

We wish to acknowledge the very helpful cooperation and assistance rendered by various officials, organizations and individuals in the preparation of this study. We especially wish to acknowledge the assistance given by Mr. John G. Marr, City Planning Engineer, Mr. W. N. Frickstad, City Engineer, and Mr. J. A. Czizek, City Traffic Engineer.

Respectfully submitted,

HARLAND BARTHOLOMEW AND ASSOCIATES

By Russell H. Riley

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JOHN F. HASSLER
CITY MANAGER

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JOHN G. MARR
ENGINEER

CITY OF OAKLAND
CALIFORNIA
CITY PLANNING COMMISSION

November, 1947

City Manager, Mayor and
Honorable City Council
City Hall
Oakland, California

Gentlemen:

Transmitted herewith is a report entitled "Freeways and Major Streets in Oakland, California". This is the third report prepared by Harland Bartholomew and Associates.

The Commission has analyzed the material therein and is in accord with the recommendations. The Commission will follow its usual procedure in having a public hearing prior to the adoption of this report by the Commission as a part of the Master Plan.

The Commission recommends that the City Council consider these matters and after public hearing adopt the report and the accompanying maps as a part of the Master Plan.

Oakland will be assured of a healthy economic growth and better traffic circulation if the recommendations herein can be attained over a period of years.

Respectfully submitted,

CITY PLANNING COMMISSION

By John G Marr
John G. Marr
City Planning Engineer

JGM:hj

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INTRODUCTION

The automobile has an unusually important role in the functioning of the Oakland urban area. The majority of persons move within the urban area by auto; a large part of the movement of persons and goods between Oakland and other areas takes place in automobiles, trucks, and buses. According to the California Division of Highways, there is one auto for every 2.8 persons in the Oakland area; the United States average is one auto for every 4.6 persons. The automobile is an integral part of the life of almost every citizen; it is a vital element of the urban economy; it influences the very pattern and arrangement of the city. Without safe, adequate, and efficient trafficways the full usefulness of the automobile can not be realized.

Oakland is an unusual city. Due to topographic conditions the urban development has taken the shape of a flat "V" following the strip of gently sloping land between San Francisco Bay and the mountains, the business district lying close to the point of the "V". In a city with no unusual topographic conditions the urban area develops rather uniformly around the business district. Traffic feeds in from all sides and no one street need serve more than a small part of the city's population. This is not the case in Oakland and the concentration of traffic here causes basic street problems.

Further, a major and rapidly growing part of the metropolitan area lies east of the business district. Between this area and the business district is Lake Merritt, some 4,000 feet long. While it is unquestionably one of Oakland's major assets, the presence of Lake Merritt forces a further constriction of the large traffic volume which must pass either north or south of the Lake in order to reach the business district.

In the usual urban area the business district and the adjacent industrial areas are the major traffic destinations. In Oakland, lying a short distance the other side of the point of the "V" from the business district, is the San Francisco-Oakland Bay Bridge leading to the San Francisco business district, a major terminus for vehicular traffic in the Oakland area. The location of this bridge greatly influences traffic movement as will additional bridges leading to San Francisco.

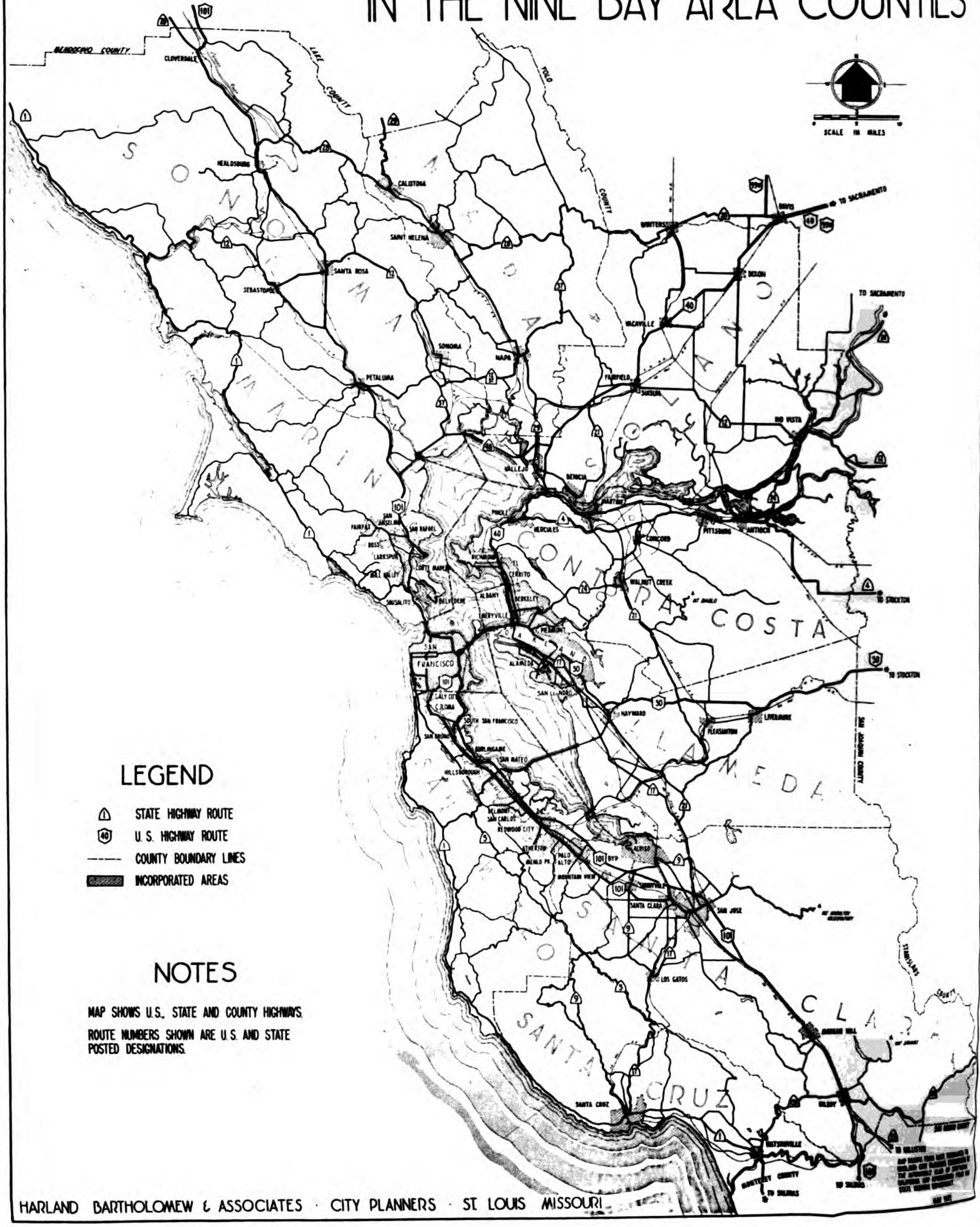
The great numbers of automobiles in Oakland when added to these unusual characteristics of the site and its development make street improvement difficult to design and expensive to construct. The street problems of Oakland are consequently more serious and more important than those of many other cities. Careful and continuous planning of the street system and expenditure of considerable sums for street improvements are essential to solve the problems brought about by the combination of these unusual conditions.

This report contains an appraisal of the present street system in relation to existing and future needs and a proposed plan for a street system to serve the needs of the metropolitan area over the next two-and-a-half decades, this plan to be a part of the Master Plan for Oakland.

Original from UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

LOCATION OF MAJOR TRAFFIC ROUTES

IN THE NINE BAY AREA COUNTIES



LEGEND

△ STATE HIGHWAY ROUTE
⬡ U. S. HIGHWAY ROUTE
--- COUNTY BOUNDARY LINES
▨ INCORPORATED AREAS

NOTES

MAP SHOWS U.S., STATE AND COUNTY HIGHWAYS.

ROUTE NUMBERS SHOWN ARE U.S. AND STATE POSTED DESIGNATIONS.

HARLAND BARTHOLOMEW & ASSOCIATES · CITY PLANNERS · ST. LOUIS MISSOURI

PLATE I

BASIC PRINCIPLES OF STREET PLANNING

STREET DESIGN CONSIDERATIONS

Right-of-Way Width

The pavement of a street can be widened or even narrowed without great difficulty. However, once a street right-of-way is acquired and buildings erected along the street, the right-of-way can be widened only after great difficulty and expense occasioned by the consequent injury to improved property fronting on the street. Because of this, the major street plan is concerned primarily with the acquisition of sufficient right-of-way width. In some cases pavements may be constructed in stages, with traffic lanes being added as congestion develops on the original street surfacing. No money is wasted in acquisition of a right-of-way that is wider than necessary for the immediate need in comparison with the costs of widening a right-of-way that is later found to be too narrow. The right-of-way should be acquired to accommodate the ultimate development of the thoroughfare.

Traffic Capacity

The capacity of a street pavement to adequately carry the traffic desiring to use it depends upon a number of factors. Chief among these are; the character of traffic (whether predominantly automobiles, trucks or buses), the size of vehicles, the established speed regulations and traffic control devices such as signals or signs, the number and width of traffic lanes, the frequency of intersections, the amount and character of cross-traffic, the alignment, steepness of grades and length of sight distances, the presence of transit tracks and safety zones, the use of the street by local buses, and whether parking is permitted along the street.

On the normal major street carrying mixed traffic at medium speeds where all streets cross at grade and traffic signals (either signs or lights or a combination of both) must be observed, the maximum capacity of each traffic lane will vary between 400 and 600 vehicles per lane per hour. Where streetcars also use the street, the track lane will carry only 300 to 450 other vehicles per hour.

Outside of the congested areas, where cross-traffic is light and permitted speeds are somewhat higher, each traffic lane will carry between 500 and 700 vehicles per hour. Where there are streetcar tracks, the capacity of the track lane will drop to approximately 450 vehicles per hour.

On major streets which will have a "limited access" construction limiting the number of street crossing connections at grade, capacities will vary between 800 and 900 vehicles per lane per hour.

On urban portions of interstate freeway routes and on other freeways, lane capacities will vary between 1,000 and 1,500 vehicles per lane per hour. This increase in capacity is due to the higher speeds permitted because of elimination of cross traffic and parking, limitation of access, and construction for higher speed of movement.

TYPES OF VEHICULAR MOVEMENT

The local street system must provide for movement between; (1) residential areas and the central business district, (2) residential areas and outlying shopping centers, (3) residentail areas and industrial districts, (4) all areas and the San Francisco-Oakland Bay Bridge and additional Bay crossings, and (5) the various parts of the urban area and the various County and State highways leading to the urban area. The central business district is a major terminus for many vehicular movements, both those originating within the City and beyond the City.

Radial Movement

The major traffic movement in any large urban area is from places of residence to places of employment and shopping. The central business district, the industrial areas, and the San Francisco-Oakland Bay Bridge are the major objectives of traffic within the Oakland area. During short periods in the morning and evening this traffic is very heavy and the major streets must be designed to accommodate the peak periods of heavy flow. Wide and direct routes radiating from the business district, industrial areas and the Bay Bridge to all portions of the urban area are essential.

Radial traffic has three origins: (1) the traffic from the residential areas of the city, (2) the highway traffic including trucks and buses (many of the radial streets continue on into the suburban areas as federal and state highways), and (3) the outlying residential and rural farm traffic. The greatest traffic flow and the greatest congestion are usually found on the radial thoroughfares.

Interconnecting or Cross-town Movement

There is also considerable movement between the different residentail districts and between residential areas and outlying commercial, industrial, public and semi-public areas. As an urban area becomes larger and more intensively developed, the inter-connecting or cross-town movement becomes more important. Cross-town streets are also used for connections or feeders between radial highways and the various residential areas.

By-Pass or Distributor Movement

While the destination of the majority of traffic movement is the central area of the city, some cross-town traffic from one area to another and to the Bay Bridge now must pass through the congested central area of the city. In so doing it is not only delayed within the central area but adds to the congestion in this small district. Routes should be provided to permit such traffic to bypass the congested sections.

There is also a considerable amount of highway traffic that should be routed around rather than through the entire urban area. Streets permitting such by-pass movements also act as distributor streets permitting local traffic to skirt an area of great congestion until the most convenient point of entry is reached.

MAJOR AND MINOR STREETS

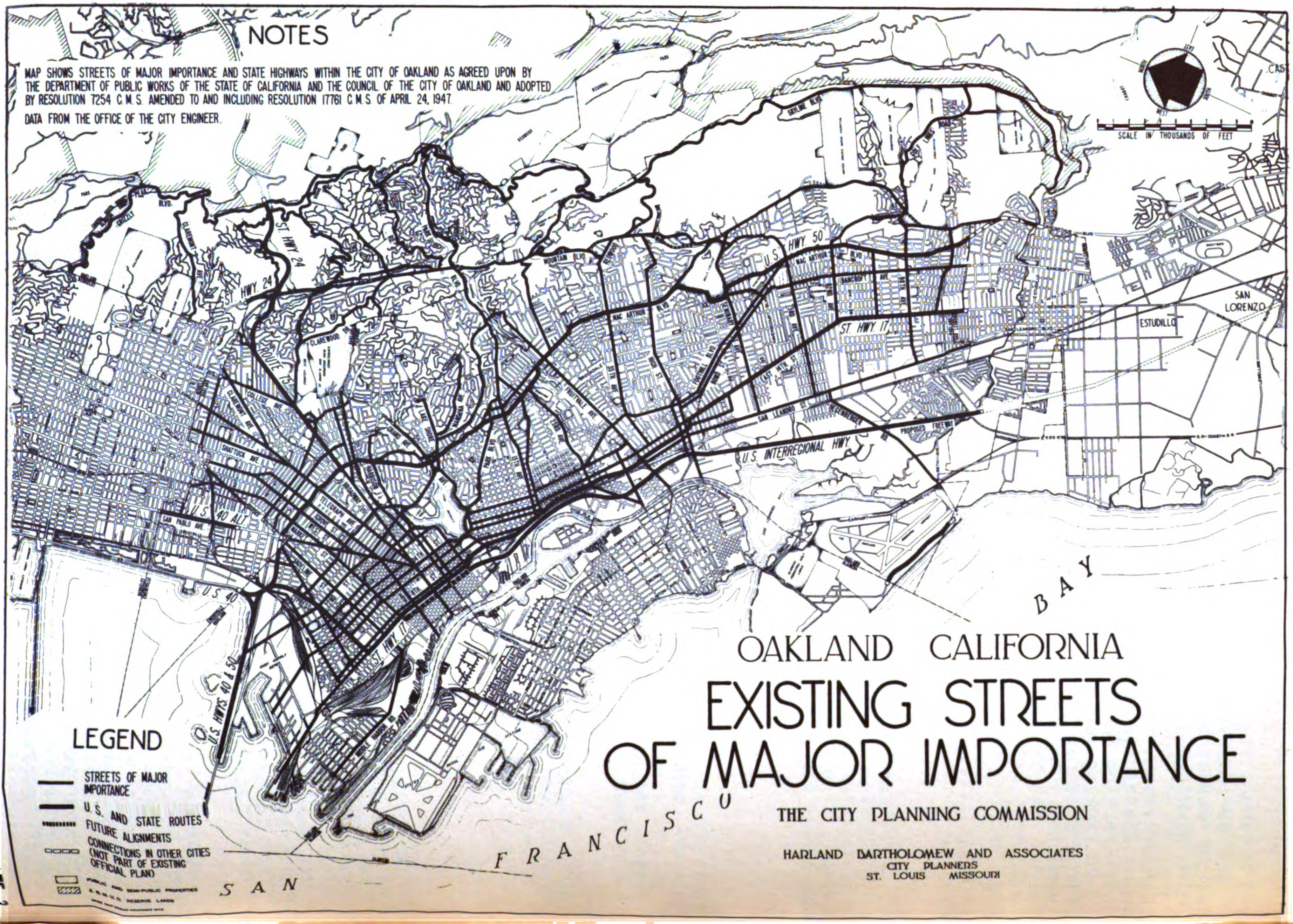
Before the advent of the automobile there was no reason for making any differentiation in the pavement or right-of-way widths of streets. There was a comparatively small volume of vehicular traffic which moved slowly and was not hazardous or detrimental. When large numbers of automobiles came to operate over these streets at relatively high speeds serious problems were created. Where all the streets were of uniform width and arrangement, through traffic moved over most of them. This made each intersection hazardous. Furthermore, the great majority of streets in an urban area are in the residential neighborhoods where heavy volumes of traffic are detrimental to residential values and hazardous to the safety of children and elderly persons.

It soon became apparent that a few of the more direct and strategically located streets should be developed with a wide and well constructed pavement for the accommodation of major traffic movements. These became known as "major streets." The remaining streets could then be developed with a less expensive narrow pavement, could be more indirect in alignment, and primarily serve adjoining property only. Experience has shown that a system of wide and direct major streets provides the only efficient method of accommodating large volumes of vehicular movement and that the development of the indirect and minor streets encourages the maintenance and enhancement of residentail districts for desirable living.

RELATION TO PARKING

New or improved traffic arteries to bring more vehicles to the business districts cannot be expected to render the maximum service to the City unless adequate parking is provided when the destination is reached.

A previous report on Off-Street Parking and Traffic Control in Oakland Business Districts analyzes the problem and presents a plan for development of adequate parking facilities for the future. In the plan, the off-street parking lots and parking garages are so located as to provide convenient terminal parking facilities for autos reaching the business districts by the important major streets.



NOTES

MAP SHOWS STREETS OF MAJOR IMPORTANCE AND STATE HIGHWAYS WITHIN THE CITY OF OAKLAND AS AGREED UPON BY THE DEPARTMENT OF PUBLIC WORKS OF THE STATE OF CALIFORNIA AND THE COUNCIL OF THE CITY OF OAKLAND AND ADOPTED BY RESOLUTION 7254 C.M.S. AMENDED TO AND INCLUDING RESOLUTION 17761 C.M.S. OF APRIL 24, 1947.

DATA FROM THE OFFICE OF THE CITY ENGINEER.

OAKLAND CALIFORNIA
EXISTING STREETS
OF MAJOR IMPORTANCE

THE CITY PLANNING COMMISSION

HARLAND BARTHOLOMEW AND ASSOCIATES
CITY PLANNERS
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PLATE 2

BASIC STREET PROBLEMS — PRESENT AND FUTURE

EXISTING STREET SYSTEM

In common with most American cities, little planning or foresight was exercised during the formative years of Oakland's growth. The first comprehensive street plan was prepared in 1927, by which time the greater part of the urban area had already been subdivided. The various individual subdivisions were laid out during a period of intense speculation. Sufficient width and continuity of alignment were not provided. No one could foresee the widespread use or high speeds of the automobile that exists today.

The fundamental aspects of the existing street system are shown on Plate 1 (see page 2) which is a map of the main highways in the Nine Bay County Area and Plate 2 which shows the existing streets of major importance in Oakland as designated by the City and approved by the State Division of Highways.

State and Federal Highways

Two important transcontinental east-west federal highways serve Oakland. U. S. Route 40 connects Oakland with East Bay communities to the north and with Sacramento. U. S. Route 50 connects Oakland with Stockton and the Lake Tahoe region to the northeast. This route now traverses Oakland on MacArthur Boulevard. Both of these routes cross San Francisco Bay on the San Francisco-Oakland Bay Bridge and terminate in San Francisco.

The urban area is also served by State Route 17 which connects Oakland with San Jose, and by State Route 24 serving the Orinda-Walnut Creek area in Contra Costa County. A legislative designated Route 75 is along Broadway between Mountain Boulevard and MacArthur. Legislative designated Route 69 traverses almost all the East Bay cities.

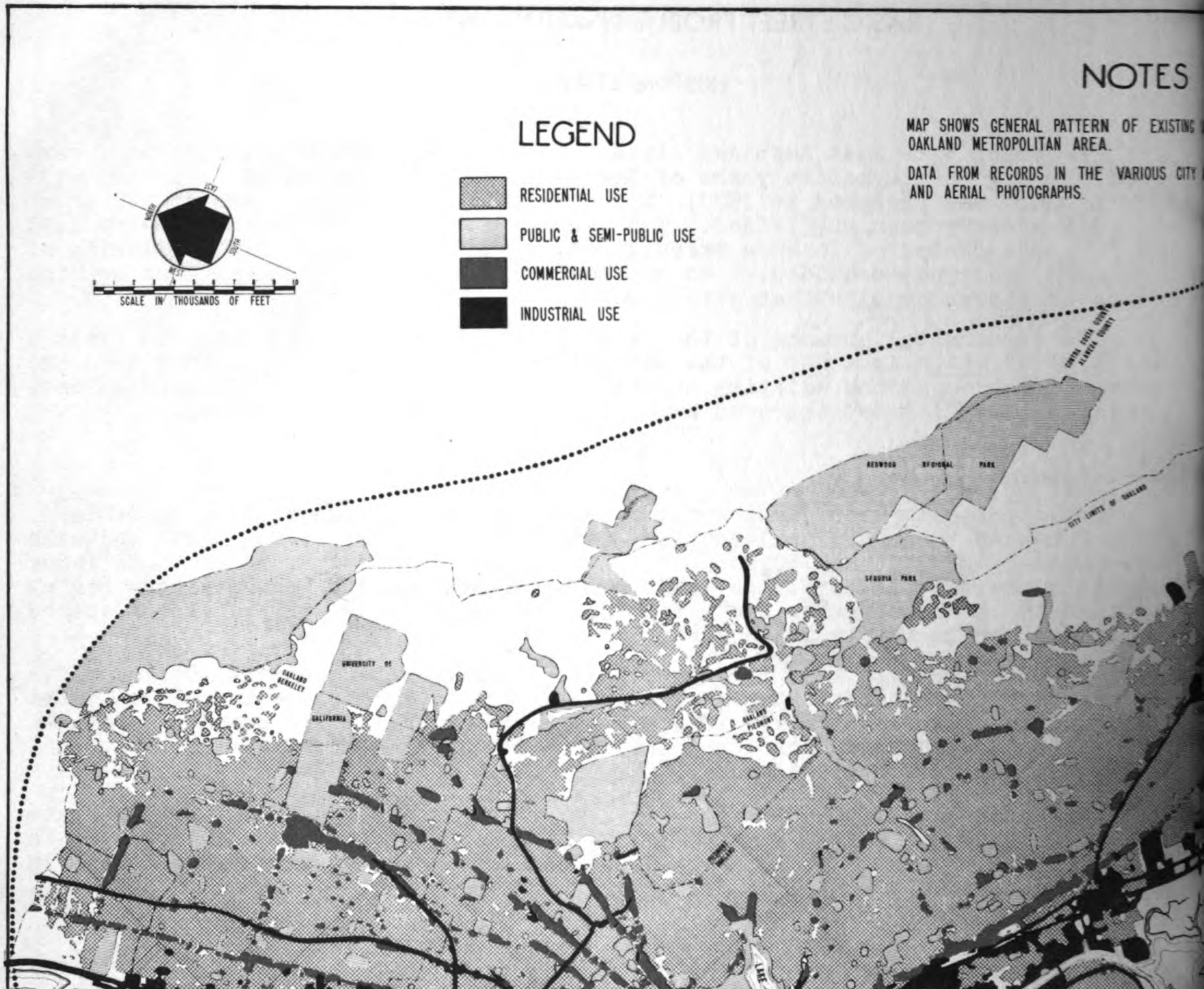
Three new legislative designations have recently been added to the State system. These are Route 227, to follow Mountain Boulevard between Broadway in Oakland and U. S. Route 50 near San Leandro; Route 226 from Webster Street in Alameda to MacArthur Boulevard in Oakland; and Route 228 which is to be a connection between Routes 50 and 69 near San Lorenzo.

Relation to Topography

The pattern of important streets in Oakland consists of a number of east-west routes such as MacArthur Boulevard and East 14th Street parallel to the Bay connecting the residential areas with the business district and the San Francisco-Oakland Bay Bridge. At irregular intervals north-south routes lead to the waterfront and connect the east-west routes. The general street pattern is quite irregular. On the lower, flatter land adjacent to the waterfront, gridiron patterns are found but these run in varying directions with most streets not having much continuity. On the steeper slopes the pattern of necessity becomes more curvilinear and informal. Here the alignment of even the important thoroughfares is not direct.

Relation to Land Use

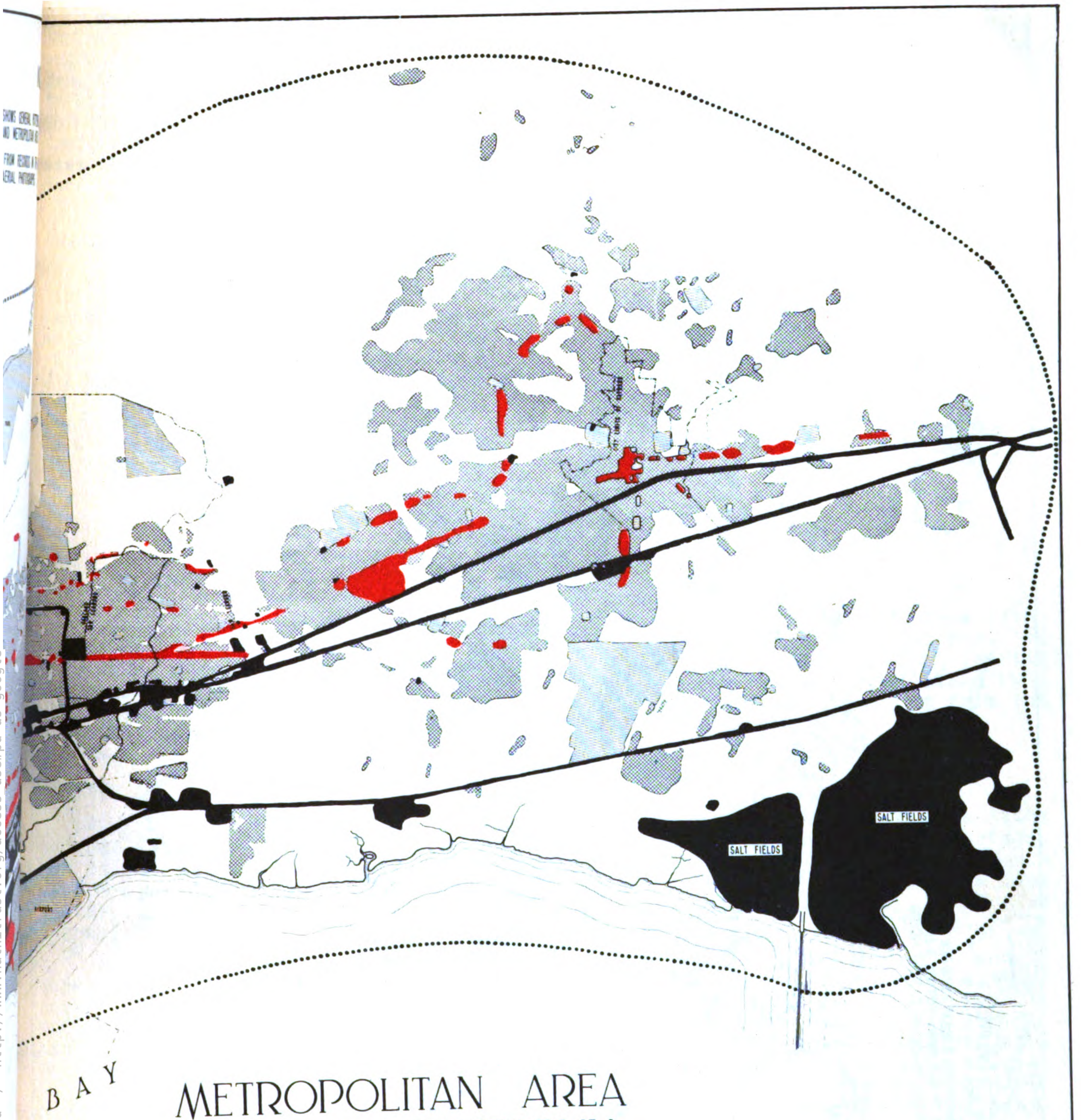
A generalized plan of existing land use is shown on Plate 3. The long narrow pattern of the urban area is apparent. Development of industry along the Estuary, the railroads to the east and the waterfront to the west results in a long, narrow industrial area. This as well as the topography will influence location of the residential areas in the future. The Oakland business district is the major commercial area. Other commerce consists largely of "string" development along important streets such as East 14th Street, Broadway, and San Pablo. Public and semi-public areas consist of Army and Navy installations along the waterfront, parks and reservations in the mountain area.



NOTES

MAP SHOWS GENERAL PATTERN OF EXISTING
OAKLAND METROPOLITAN AREA.

DATA FROM RECORDS IN THE VARIOUS CITY
AND AERIAL PHOTOGRAPHS.



METROPOLITAN AREA
OAKLAND CALIFORNIA

E EXISTING USES OF LAND

THE CITY PLANNING COMMISSION

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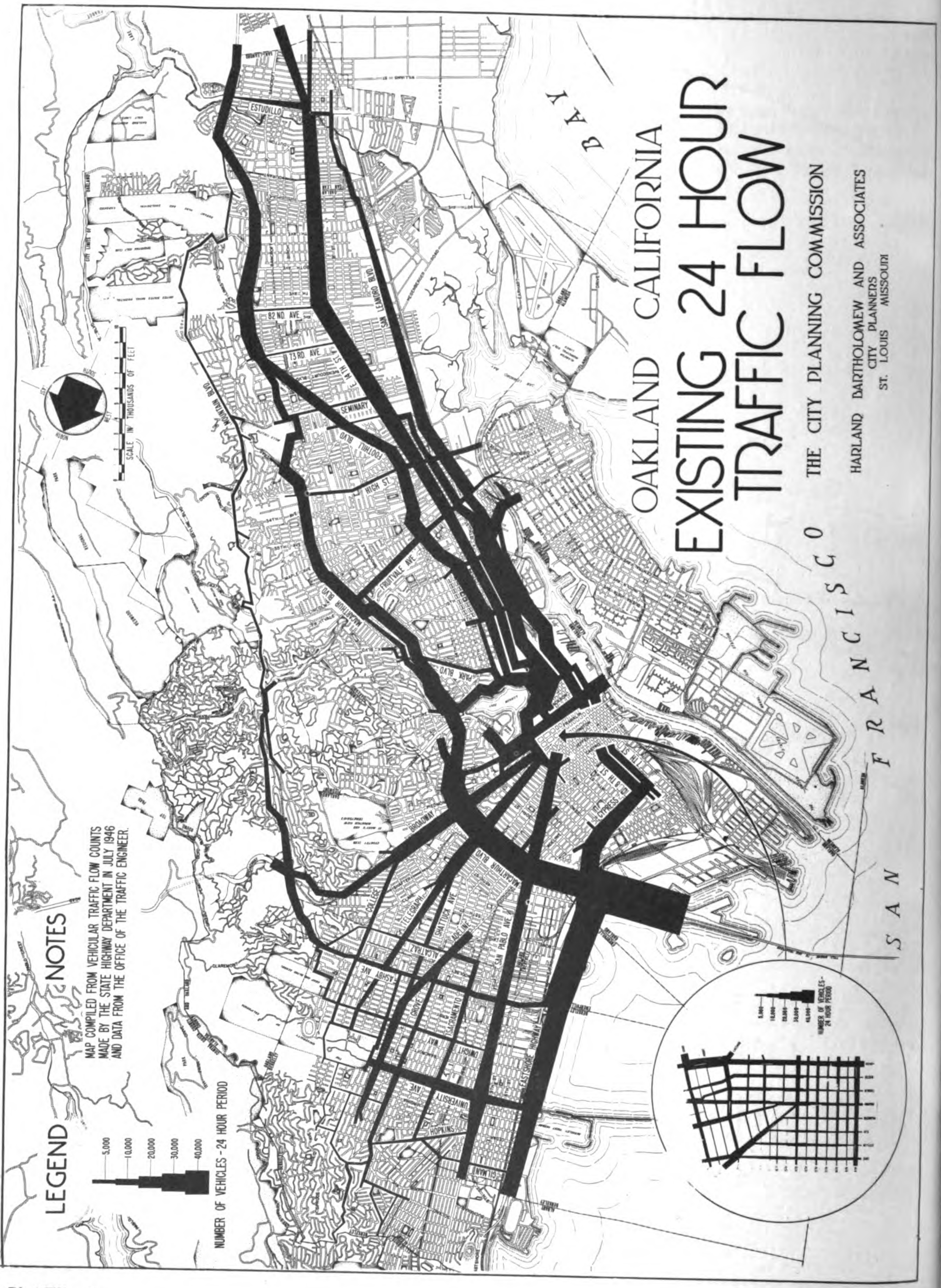
PLATE 3



OAKLAND CALIFORNIA
EXISTING 24 HOUR TRAFFIC FLOW

THE CITY PLANNING COMMISSION

HARLAND BARTHOLOMEW AND ASSOCIATES
CITY PLANNERS
ST. LOUIS MISSOURI

PLATE 4

Major problems of traffic movement result from the land use arrangement. The many persons living east of the business district must use only a few thoroughfares to reach the business district, the Bay Bridge and the major industrial areas. This traffic is highly congested upon these few streets as the termini are approached. Another major problem is Lake Merritt, separating all this traffic and the business district, which forces an already concentrated traffic into two constricted funnels. Furthermore, outside of the central business district commercial areas have strung out along these few roads in long narrow ribbons further increasing congestion along their entire lengths.

Relation to Population Growth

Future population growth will aggravate rather than alleviate these conditions. The East Bay Municipal Utility District estimates that the metropolitan area will grow from a 1945 population of 668,000 to 901,000 in 1970. The major areas of new growth are expected to be in the San Leandro-Hayward area with Eden Township accounting for about one-fourth of the estimated increase. While all parts of the metropolitan area are expected to grow the major result can only be a further elongation of the urban pattern. Additional population is expected in the hill areas and in the Orinda-Moraga portion of Contra Costa County, but this growth will be limited by the rough topography and because of the extensive reserves of the East Bay Municipal Utility District.

EXISTING TRAFFIC FLOW

City Streets

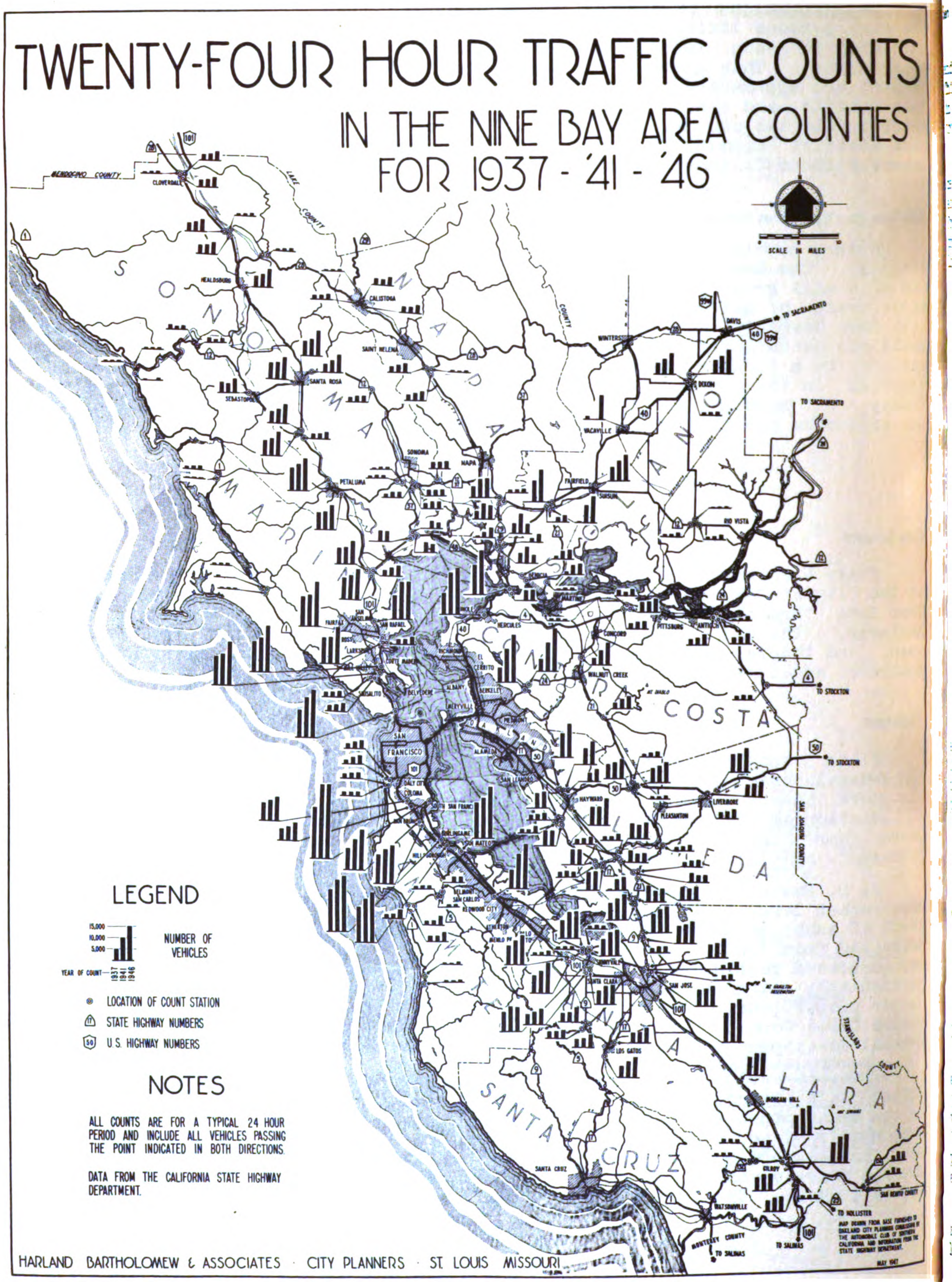
Plate 4 shows the average 24-hour traffic volume on important streets within the City of Oakland during the spring of 1947. This Plate has been compiled from data furnished by the State Division of Highways and the City Traffic Engineer. The major destinations of traffic, the streets that are intensively used, and the large volumes of traffic entering the business district from the southeast are clearly indicated on this Plate.

Highways

Plate 5 shows graphically the comparison of highway traffic on the State and Federal routes within the Nine Bay County Area for three different periods. The years chosen for this comparison were 1937, representing the first full year of operation of the San Francisco-Oakland Bay Bridge, 1941 representing the last prewar year - and the highest traffic attained up to that time on California highways - and 1946, the first full year following the end of hostilities.

U. S. Route 101 north and south of San Francisco and U. S. Routes 40 and 50 show rather large traffic increases during the last decade. For example, just north of Ashby Avenue on U. S. Route 40 (Eastshore Highway), the 24-hour traffic increased from 7,000 vehicles in 1937 to 49,800 in 1946. In general, traffic has increased considerably on all State and Federal routes serving Oakland with particularly large increases apparent on U. S. Routes 40 and 50 and an even larger proportionate increase in traffic on State Route 24 from Oakland into Contra Costa County. Part of this heavy increase is accounted for by the residential developments in the Orinda-Walnut Creek area.

Prior to World War II the steady increase of motor vehicle travel in the United States reached a peak during 1941. During the war period, restrictions on the manufacture and use of automobiles caused the annual travel mileage to drop nearly 40 per cent for the United States, but the drop was less than 30 per cent for California. Following the end of the war, motor vehicle travel increased sharply and by the end of 1946 had reached the 1941 total for the country as a whole. The increase was notably greater in California.



TWENTY-FOUR HOUR TRAFFIC COUNTS
IN THE NINE BAY AREA COUNTIES
FOR 1937 - '41 - '46

LEGEND

◉ LOCATION OF COUNT STATION

⚠ STATE HIGHWAY NUMBERS

⬡ U.S. HIGHWAY NUMBERS

NOTES

ALL COUNTS ARE FOR A TYPICAL 24 HOUR PERIOD AND INCLUDE ALL VEHICLES PASSING THE POINT INDICATED IN BOTH DIRECTIONS.

DATA FROM THE CALIFORNIA STATE HIGHWAY DEPARTMENT.

MAP DRAWN FROM BASE FURNISHED BY OAKLAND CITY PLANNING COMMISSION, THE AUTOMOBILE CLUB OF SOUTHERN CALIFORNIA AND INFORMATION FROM THE STATE HIGHWAY DEPARTMENT.

MAY 1947

HARLAND BARTHOLOMEW & ASSOCIATES · CITY PLANNERS · ST. LOUIS MISSOURI

PLATE 5

San Francisco-Oakland Bay Bridge

Plate 6 (page 14) shows graphically the proportion of Trans-Bay automobile and truck traffic originating in or destined for various zones in the East Bay. This Plate was compiled from data obtained by the State Toll Bridge Authority, in answer to questionnaire cards distributed to all westbound automobiles and trucks on a typical day in March of 1946.

The following tabulation is taken from a recent report of the State Department of Public Works concerning preliminary studies of an additional bridge across the Bay. Since completion in 1936, vehicular traffic across the San Francisco-Oakland Bay Bridge has consistently exceeded all expectations and at present studies are being made for construction of a second Bay crossing at a location as yet undetermined.

AVERAGE 24-HOUR TRAFFIC
SAN FRANCISCO-OAKLAND BAY BRIDGE

	Light Passenger Vehicles	Buses	Trucks	Non-Revenue Vehicles	Total
1937	23,575	261	855	252	24,943
1938	21,638	395	1,148	438	23,619
1939	27,416	530	1,532	556	30,034
1940	38,410	700	1,948	648	41,706
1941	47,378	1,155	2,616	1,178	52,327
1942	47,674	1,765	3,093	3,827	56,359
1943	42,860	1,372	3,526	4,732	52,490
1944	40,194	1,407	3,820	5,467	50,888
1945	48,740	1,498	4,000	6,384	60,622
1946	59,945	1,397	4,274	3,698	69,314
1947 (first six months)		-	-	-	69,891

FUTURE TRAFFIC FLOW

In order to estimate future traffic flows it is necessary to take into account the factors of industrial expansion, population increases and increases in car ownership (which will affect car registrations), increased usage of individual automobiles, and the increase in traffic which will be generated by improved streets and highways.

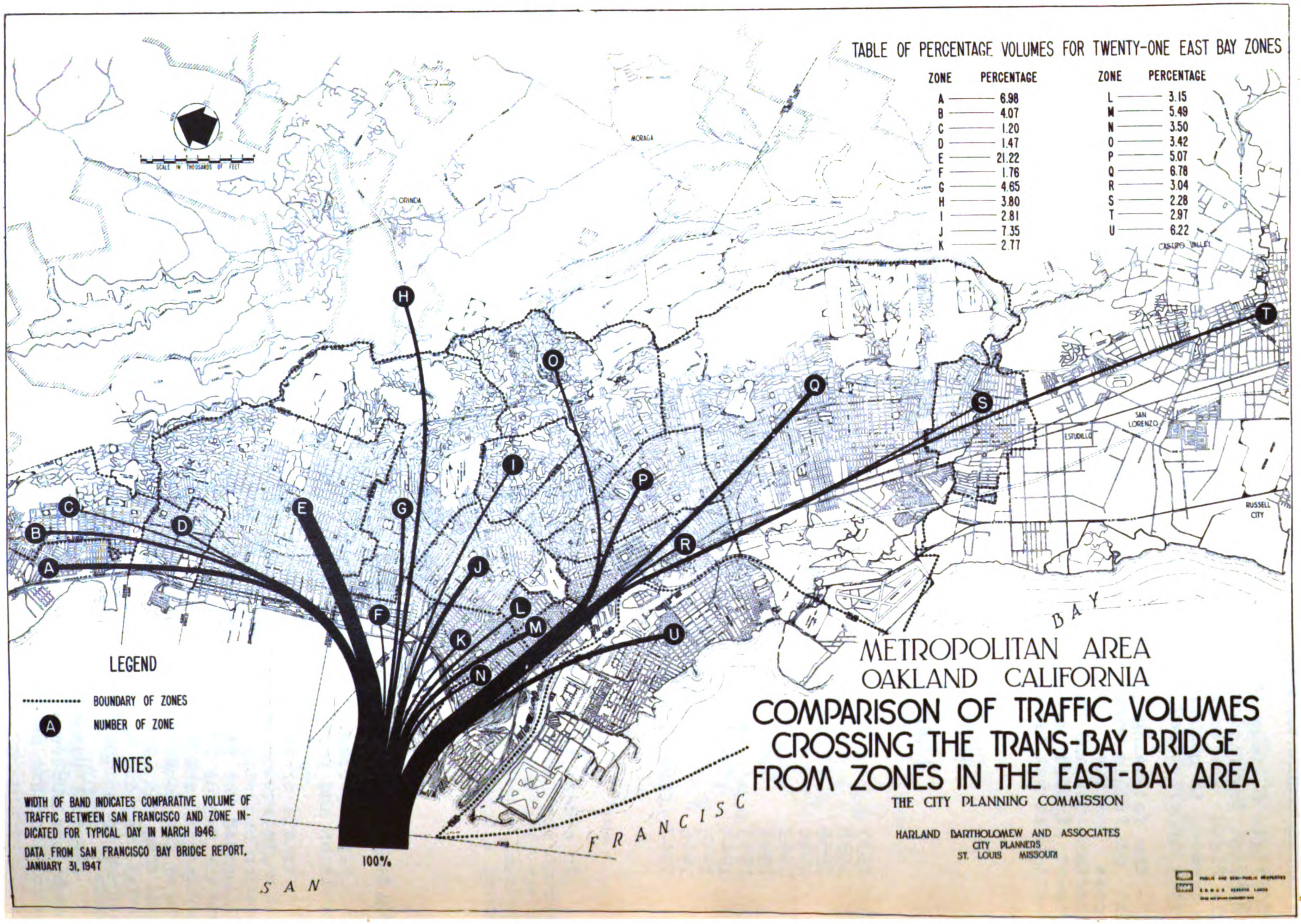
FACTORS INFLUENCING INCREASE IN TRAFFIC MOVEMENT

Auto Registration and Population

Plate 7 (page 16) shows graphically the comparison between automobile registration and population in the Nine Bay Counties for 1920, 1930, 1940 and 1944.

In all of the Counties there was considerable increase in both population and registration between 1920 and 1940 with the greatest increase in auto registration occuring between 1920 and 1930. The economic depression of the 1930's influenced the slower increase in registration during this decade. Between 1940 and the Census Bureau estimates made in 1944, there was a pronounced increase in population and a much smaller proportionate increase in car registration. In two of the counties, San Francisco and Santa Clara, the 1944 registrations were less than the 1940 figures. The reduction in registration during the four-year period was due to the large influx of war workers and the restrictions upon automobile production and the use of gasoline.

A recent report by the California Legislature Joint Fact-Finding Committee summarizes numerous population estimates with the result that a state-wide population increase of 49 per cent between 1945 and 1970 is predicted.



METROPOLITAN AREA
OAKLAND CALIFORNIA

COMPARISON OF TRAFFIC VOLUMES CROSSING THE TRANS-BAY BRIDGE FROM ZONES IN THE EAST-BAY AREA

THE CITY PLANNING COMMISSION

HARLAND BARTHOLOMEW AND ASSOCIATES
CITY PLANNERS
ST. LOUIS MISSOURI

TABLE OF PERCENTAGE VOLUMES FOR TWENTY-ONE EAST BAY ZONES

ZONE	PERCENTAGE	ZONE	PERCENTAGE
A	6.98	L	3.15
B	4.07	M	5.49
C	1.20	N	3.50
D	1.47	O	3.42
E	21.22	P	5.07
F	1.76	Q	6.78
G	4.65	R	3.04
H	3.80	S	2.28
I	2.81	T	2.97
J	7.35	U	6.22
K	2.77		

LEGEND

- ·············· BOUNDARY OF ZONES
- Ⓐ NUMBER OF ZONE

NOTES

WIDTH OF BAND INDICATES COMPARATIVE VOLUME OF TRAFFIC BETWEEN SAN FRANCISCO AND ZONE INDICATED FOR TYPICAL DAY IN MARCH 1946.

DATA FROM SAN FRANCISCO BAY BRIDGE REPORT, JANUARY 31, 1947

PLATE 6

Population studies made in 1946 by the East Bay Municipal Utility District indicate a 36 per cent population increase in the Oakland Metropolitan Area between 1944 and 1970.

Plate 7 also shows both the estimated 1970 population and automobile registrations in the Nine Bay Counties. The former is based on data compiled by the East Bay Municipal Utility District and the 1970 automobile registrations are based on estimates made by the State Division of Highways which indicate an ownership ratio of 2.4 persons per car by 1970. As may be seen from the Plate, if this ratio is attained facilities must be provided in Alameda County and Contra Costa County for the local movement of approximately twice the number of automobiles registered in those counties in 1944.

Automobile Ownership

The Division of Highways estimates that there is now one automobile for each 2.8 persons in the Oakland Area, and that by 1970 there will be one car for each 2.4 persons - an increase of 16 per cent in the ratio of automobiles to population.

The California Legislature Joint Fact-Finding Committee report estimated a state-wide increase of 29 per cent in the ratio of automobiles to population between 1946 and 1970.

Increased Automobile Usage

The California Legislature Joint Fact-Finding Committee report further estimated that there will be a ten per cent increase in motor vehicle use between 1946 and 1970.

ESTIMATES OF FUTURE TRAFFIC

Future Trans-Bay Traffic

Plate 6 shows that approximately 11 per cent (or 7,500 vehicles) of the present Bay Bridge traffic is highway traffic originating outisde the Oakland Metropolitan Area. A state-wide population increase of 49 per cent, a state-wide increase of 29 per cent in car ownership, and an increase of 10 per cent in car usage indicates that by 1970 the highway portion of the Trans-Bay traffic will be 15,800 vehicles.

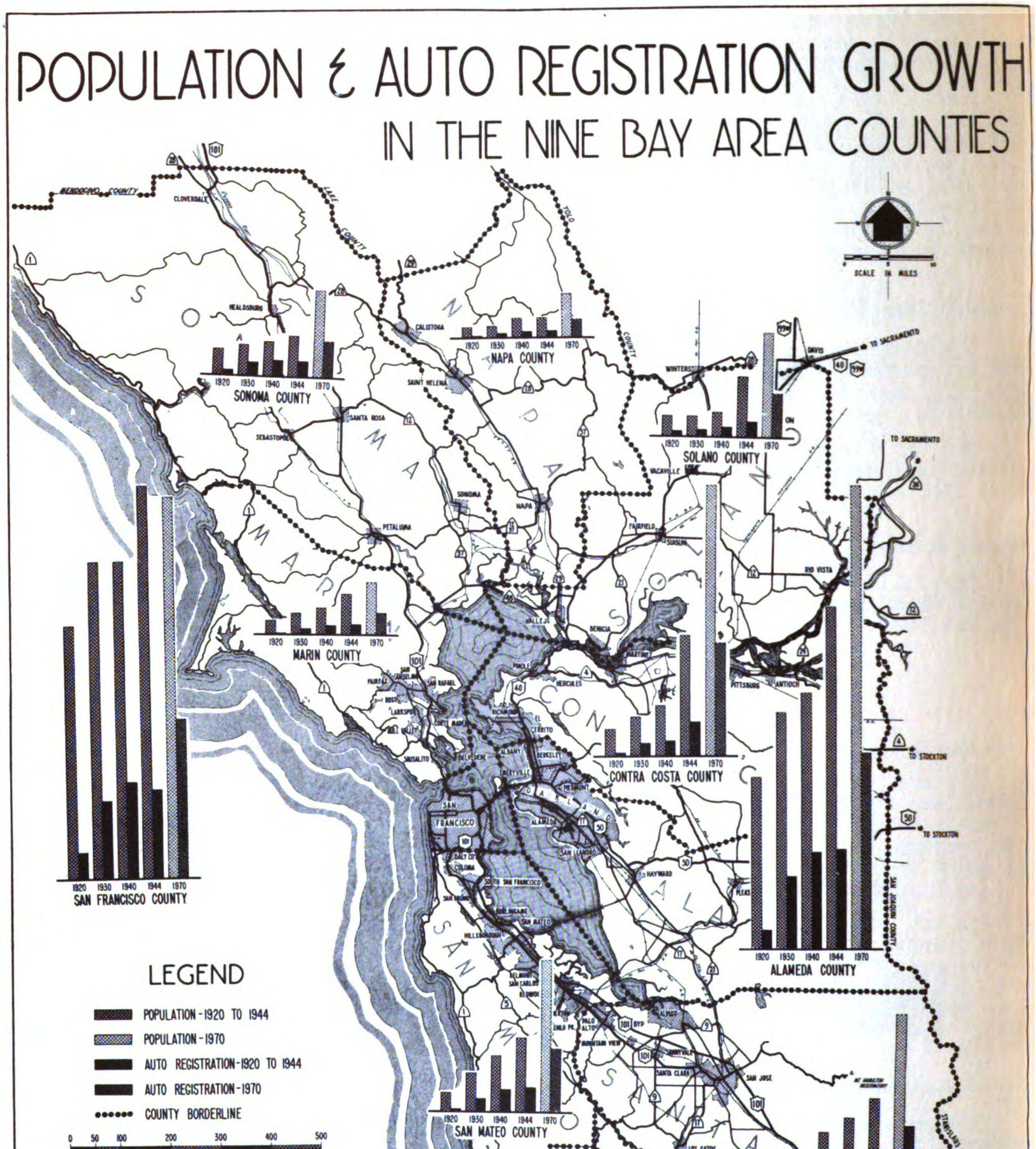
In the last full year for which figures are available (1946) of the average daily traffic of 69,300 vehicles, 61,800 vehicles originate locally. Applying the factors of 36 per cent population increase, 16 per cent increase in ownership, and 10 per cent increase in automobile usage, indicates a total of 106,900 local vehicles by 1970. The combined traffic is estimated to be 122,700 vehicles, or an overall increase of 77 per cent.

Future Traffic Using Northern Entries to Business District

Future traffic into and out of the Oakland Central Business District can be estimated in the same manner. For the northern entries the increase in tributary population within the cities of Oakland, Berkeley and Emeryville is estimated at 30 per cent, increase in car ownership at 16 per cent, and increase in car usage at 10 per cent. To these should be added 20 per cent for increases which will be generated by improved and additional entries to the business district. Improvements such as the Shafter-Grove Street Freeway will attract additional traffic to the business district. The estimated total increase to be expected at the periphery of the business district in the San Pablo-Webster Street sector would then be 99 per cent.

The 1946 traffic outbound from the business district during the evening peak hour totaled 4,069 vehicles. The 1970 estimated outbound peak hour traffic will be 8,100 vehicles.

POPULATION & AUTO REGISTRATION GROWTH
IN THE NINE BAY AREA COUNTIES



LEGEND

▨ POPULATION - 1920 TO 1944
▨ POPULATION - 1970
■ AUTO REGISTRATION - 1920 TO 1944
■ AUTO REGISTRATION - 1970
●●●●●● COUNTY BORDERLINE

0 50 100 200 300 400 500
LENGTH OF BAR INDICATES NUMBER OF PERSONS AND AUTO REGISTRATION IN THOUSANDS

NOTES

POPULATION AND AUTO REGISTRATIONS FOR 1920 TO 1944 FROM U.S. CENSUS AND STATE OF CALIFORNIA RECORDS.

1970 POPULATION ESTIMATES FROM EAST BAY MUNICIPAL UTILITIES DISTRICT AND OTHER SOURCES.

FUTURE AUTO REGISTRATION COMPUTED FROM TRENDS IN AUTO OWNERSHIP AND ESTIMATED POPULATION.

MAP DRAWN FROM BASE FURNISHED TO OAKLAND CITY PLANNING COMMISSION BY THE AUTOMOBILE CLUB OF SOUTHERN CALIFORNIA AND INFORMATION FROM THE STATE HIGHWAY DEPARTMENT.
MAY 1947

HARLAND BARTHOLOMEW & ASSOCIATES · CITY PLANNERS · ST. LOUIS MISSOURI

PLATE 7

Original from UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

Future Traffic Using Eastern Entries to Business District

Future traffic approaching the Oakland Central Business District to enter above and below Lake Merritt can be divided into local traffic and through traffic. Population increases of about 57 per cent are expected in the area south and east of Lake Merritt between 1945 and 1970. These increases include the expected development in Eden Township. To the population increases should be added the increase of 16 per cent in car ownership and the increase of 10 per cent in individual car usage, making a total increase in expected local traffic of 98 per cent. The total traffic in both directions crossing above and below Lake Merritt amounted to 172,000 vehicles in an average 24-hour day during 1946. The 1946 traffic on through highways at the edge of the urban area (south and east of Hayward) was 22,000 vehicles in both directions during an average 24-hour day. Therefore the local traffic at Lake Merritt was 150,000 vehicles. Applying the above 98 per cent increase in local traffic gives an estimated 1970 total of local traffic above and below Lake Merritt of 297,000 vehicles. The increase in through traffic by 1970 will be the 16 per cent increase in car ownership plus ten per cent increase in individual vehicle usage, plus the 49 per cent state-wide population increase as estimated in the Collier Committee Report. This indicates a total increase of 90 per cent. Applying this increase to the 1946 through highway traffic, gives a 1970 highway traffic of 41,800 vehicles. The combined total traffic above and below Lake Merritt would then be 339,000 vehicles.

To this figure should be added 20 per cent to cover the increase in traffic which will come about through the increased use of improved and new streets, new freeways, highway improvements within the metropolitan area, and to cover such factors as the proposed new Park Boulevard tunnel to Contra Costa County and traffic which would be generated by the new industrial development to be expected in East Oakland and Eden Township. Application of all these factors will bring the 1970 estimated traffic above and below Lake Merritt to approximately 407,000 vehicles (or 2.3 times the 1946 average 24-hour traffic.)

Entries Above Lake Merritt

With the existing street pattern the thoroughfares used by the great majority of traffic crossing the city above Lake Merritt are restricted to MacArthur Boulevard, Santa Clara-Lake Park Avenue and the Embarcadero at the head of Lake Merritt. Records obtained by the City Traffic Engineer over a period of several years indicate that the peak hour traffic flow at this point is 8 per cent of the average 24-hour flow. On MacArthur and Santa Clara-Lake Park Avenue the eastward flow during the peak hour amounts to approximately 65 per cent of the total peak hour flow and on the Embarcadero the eastward movement amounts to about 60 per cent of the total peak hour flow. Applying these factors gives a total eastward movement during the peak hour of 3,680 vehicles at the present time.

Applying the estimated increase factor of 2.3 times, the 1970 traffic to be accommodated above Lake Merritt would amount to 8,500 vehicles moving in an eastward direction during the evening rush hour.

Entries Below Lake Merritt

With the existing street pattern the thoroughfares used by traffic crossing below Lake Merritt include the 12th Street Dam, 10th Street and 8th Street. Factors developed by the City Traffic Engineer indicate that on 10th Street and 8th Street the peak hour flow amounts to 9.4 per cent of the total 24-hour traffic and that of this peak hour flow, 65 per cent of the vehicles are moving in an eastward direction. The peak hour eastbound flows are 1,300 on 10th Street and 1,515 on 8th Street. On the 12th Street Dam a detailed traffic analysis made in 1946 showed an eastward movement during the evening rush hour of 3,299 vehicles. The total eastbound movement below Lake Merritt during the evening rush hour at present is 6,114 vehicles. Applying the estimated increase factor of 2.3 times, the 1970 estimated eastbound peak hour traffic will be approximately 14,000 vehicles.

INADEQUACIES AND PROBLEMS

Trans-Bay

Vehicular traffic increases on the present San Francisco-Oakland Bay Bridge have been far beyond the most optimistic estimates since it was opened in the fall of 1936. Periods of traffic congestion on the bridge and on the eastern approaches are many and hazardous. The distribution structure and the streets leading thereto are inadequate to handle the traffic at peak periods. Recognizing the need for a second crossing, extensive studies relative to location, character, and traffic distribution requirements at terminal points have been under way during the past two years by various agencies.

Alameda

Traffic entries into Oakland from Alameda are very important to both cities. The most direct connection between the business districts of the two cities is the Posey Tube under the Estuary. This is a two-lane structure carrying approximately 28,000 vehicles per day and is totally inadequate to handle present traffic volumes without considerable delays during peak hours. A recent peak hour count revealed that the two lane tube accommodated 4,200 vehicles but that long delays were encountered at each end. The Park Street Bridge and the High Street Bridge are modern structures, but the Fruitvale Bridge is in need of replacement or extensive repair. The Earhart Drive-Hegenberger connection provides a useful artery between Alameda and East Oakland. However, the condition of the Bay Farm Island Bridge is such as to preclude the full use of the tributary thoroughfares until the bridge is rebuilt.

In the future, additional entries to Oakland from Alameda must be provided to handle the growing traffic between the cities.

Berkeley

At present there are no connections between the Berkeley and Oakland Central Business Districts which are free from heavy cross-traffic. In the future, traffic will increase between the two cities and the problem becomes one of providing a freeway connection for through traffic supplemented by improved surface streets for local movement.

North

Through traffic between Oakland and Albany, Richmond and other cities to the north uses San Pablo Street and the Eastshore Highway. The Eastshore Highway is designated as a portion of the interstate system and as such will be improved to freeway standards in the future. This artery, plus the necessary improvements of the Bay Bridge distribution structure and the improvement of Cypress Street and the balance of the Eastshore Freeway, will provide a through route completely free from cross traffic and capable of moving large volumes of traffic.

Contra Costa County

Traffic moving into Oakland from Contra Costa County is at present restricted to the single entry provided by the Broadway Tunnel. The capacity of this route is adequate for present traffic but it is expected that in the future there will be considerable development in the Orinda-Moraga area thus materially increasing traffic from these sections into Oakland. When this occurs Broadway will be inadequate to handle traffic volumes and it will be necessary to provide another route - preferably a freeway - to remove at least a greater part of this traffic volume from Broadway. With the increase in traffic from Contra Costa County, several problems will result; (1) movement of this traffic into the Oakland business district, (2) movement of traffic through Oakland to the Bay Bridge and, (3) additional entries into Oakland from Contra Costa County. Solution to the first two problems can be attained by provision of a freeway from

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upper Broadway to a connection with the Berkeley-Oakland Freeway, and also to the MacArthur Freeway which will provide access to the Bay Bridge. The solution to the third problem will probably require a tunnel and a new thoroughfare between the Moraga area and Oakland.

Northeast of the business district improvements and extensions to existing streets will be sufficient to provide entries for the increased local traffic seeking to enter the business district.

East of Central Business District

East of the business district the barrier interposed by Lake Merritt restricts traffic movements to the through streets above and below the Lake. Above the Lake practically all of the traffic movements are confined to Mac Arthur-Santa Clara and to the divided roadway on the Embarcadero. In the future, traffic volumes will increase appreciably. Due to topographic conditions the problem becomes one of increasing the traffic capacity of the available roadways rather than the construction of additional thoroughfares on new rights of-way.

Below Lake Merritt the traffic is restricted to the 12th Street Dam, 10th Street and 8th Street. These arteries are operating very close to capacity at the present time. Much larger traffic volumes are expected in the future and if the central business district is to continue to develop concurrently with the rest of the Oakland area, additional facilities must be provided for the movement of traffic into and out of the central business district, and in addition a by-pass route must be developed for the use of traffic not desiring to enter the business district. This latter development will remove through traffic from the business district streets, leaving them available for the use of shoppers and others having business within the district.

The seriousness of the problem of traffic movement below the Lake is evident when it is noted that the anticipated 1970 vehicular traffic, which will desire to leave the business district during the evening peak hour, will be more than twice the present eastbound traffic volume using the street facilities below Lake Merritt.

TYPES OF STREETS NEEDED BY 1970

FREEWAYS

Even though the automobile has been in general use for over two decades the development of the streets required for satisfactory use of this vehicle continues to lag far behind the design and development of the vehicle itself. Autos can travel at greater speeds than permitted by our streets and highways. Some of the streets and highways are so inadequate that, for limited distances, at peak periods, the automobile is forced to travel at slower speed than was possible in the days of the "horse and buggy". It seems reasonable to expect the automobile to remain a primary transportation media for the next several decades. Because of the many operational and terminal problems it is not probable that the helicopter will replace the automobile during this period, or supplant it to any appreciable extent. Automobile design will continue to improve. Road design and development must be such as to permit efficient use of the vehicle.

In addition to economic loss through congestion, the loss of life and property through automobile accidents becomes more serious every year. Construction of safety features as a part of the street or highway is essential as one means of reducing this accident loss. The ordinary surface street, no matter how wide, is not an efficient means of transporting large volumes of traffic when there are intersections every few hundred feet. Each intersection is a hazard and a source of delay and congestion.

The "freeway" or express highway, is the modern answer to the problem. This is a street on which there are no intersections at grade - cross streets being carried over or under and being reached by ramps. The opposing streams of traffic are separated by a median strip. Abuting property has no right of direct access to the freeway, but is served by local service streets alongside the freeway or by existing local streets paralleling the freeway. These local streets are connected to the freeway at varying intervals. The freeway can carry large volumes of traffic efficiently and safely.

Urban freeways are a necessary part of the major street system, but are expensive to build. They require wide right-of-way, overpasses and underpasses, and in many cases rebuilding of portions of intersecting streets. In return, freeways permit the speedy and uninterrupted movement of large volumes of traffic and thus reduce the traffic burden on local streets.

Urban freeways within the Oakland Metropolitan Area afford about the only remaining practicable location for rapid transit rail lines. Rapid transit rails can be accommodated within the median strip, provided that a sufficiently wide right-of-way is acquired for the freeways to permit a median strip of 40 or 50 feet in width. If the rapid transit facilities are not constructed, the wide median strip can be used for additional roadway width at some future date. A system of freeways will be required in Oakland - two parallel with the long narrow urban area serving the business district and the Bay Bridge, one to Berkeley, at least one to Alameda, and one to Contra Costa County. In addition, the Posey and new parallel tube together with a portion of Webster Street in Alameda will in effect be a freeway connection between Oakland and Alameda.

INTERSTATE HIGHWAYS

Early in 1941 a "National Inter-Regional Highway Committee" was appointed to investigate the need for a limited system of national highways to serve the major inter-regional traffic movements in the United States. This committee submitted its report in January, 1944 and the major proposals have been incorporated in federal highway legislation. The legislation provides that certain of the more strategic federal highways be developed to a high standard in order to accommodate the major part of inter-regional highway movements in the United States. The committee proposed that this system comprise 33,920 miles of highways.

In their investigations the Inter-Regional Highway Committee found that the greatest delays and the major congestion along the federal highways were in the urban portions of the highway system.

The Committee recognized that in order to handle large traffic volumes, the urban portions of these routes must be constructed to eliminate as much of the delays and congestion as possible. Accordingly, design standards were set up which provide for freeways on wide rights-of-way. All cross traffic at grade is eliminated, access to the roadway is limited to strategic locations, median strips separate opposing streams of traffic, and easy curves and long sight distances are required.

In the Oakland Metropolitan Area, as in virtually all cities, the federal highways now enter the central areas over surface streets. Highway traffic is added to the large amounts of local and suburban traffic on these streets resulting in the creation of serious impediments to free traffic flow to the central areas of the city. The one portion of the Eastshore Highway between Albany and the San Francisco-Oakland Bay Bridge distribution structure was originally the only route in the central area on which traffic moved with anything approaching freeway conditions. Recent developments whereby additional points of access were created, have materially impaired its use as a freeway.

The inter-regional highways, (or interstate as they are now called), will enter the urban areas and provide a through route to the central business districts and the major industrial sections. In the Oakland area these routes will also serve the San Francisco-Oakland Bay Bridge.

In the Oakland Metropolitan Area the designated portions of the interstate system include the Eastshore Highway to the north and the Eastshore Freeway to the south, to connect with U. S. Route 50 east of Hayward. Grade separation structures are now under construction on the Eastshore Freeway between 6th and Fallon Streets and High Street in Oakland. According to the present schedule the Eastshore Freeway will be available for use to the south city limits of Oakland some time in 1949. Completion of this portion of the Eastshore Freeway will permit a great deal of East Oakland-Eden Township traffic to avoid the more congested portions of San Leandro Boulevard, East 14th Street, East 12th Street, and others, in reaching the central business district and the San Francisco-Oakland Bay Bridge, and will free these streets for local traffic.

MAJOR STREETS

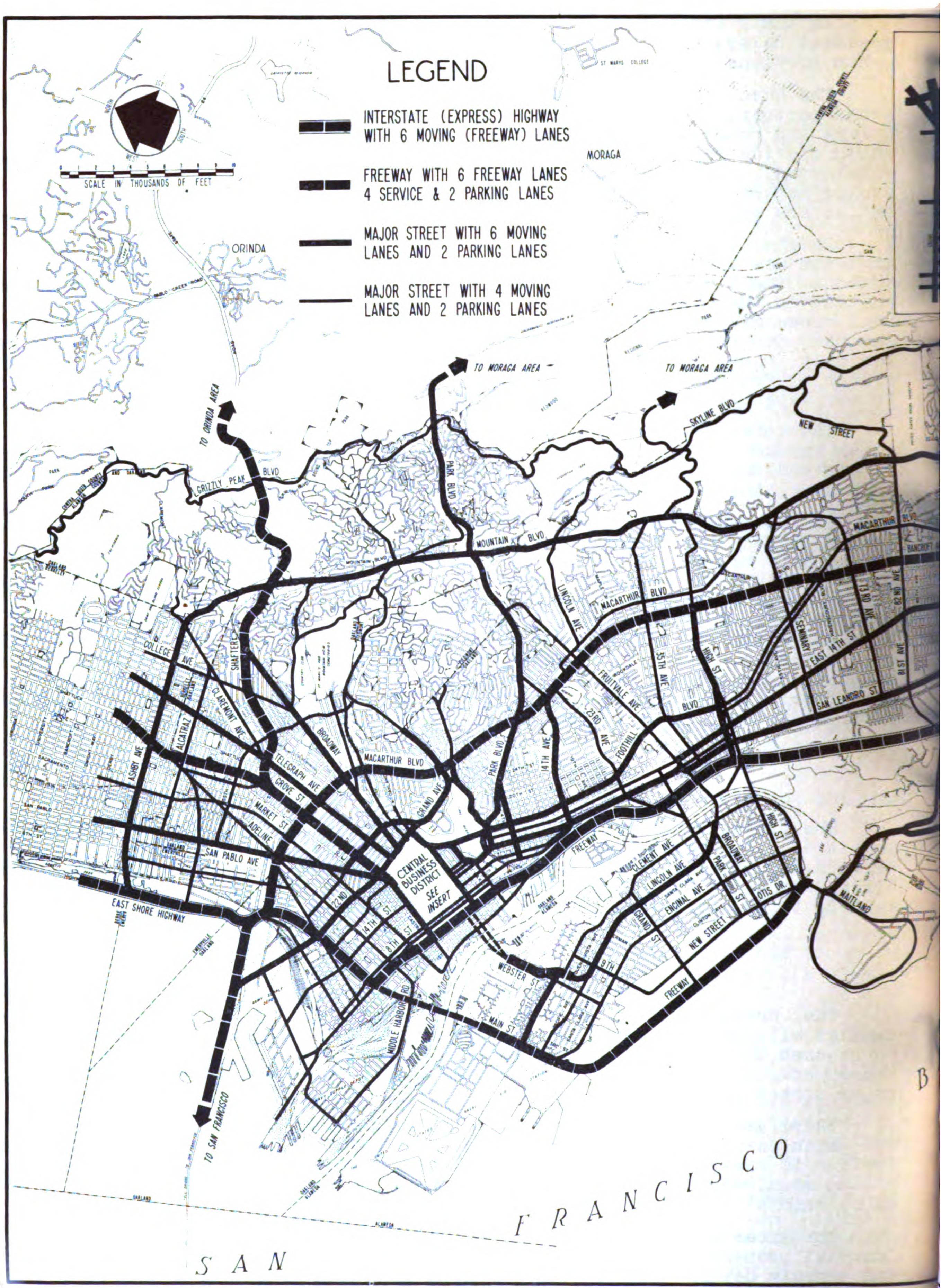
The freeways and interstate routes can solve many but not all of the street problems. A supplemental system of major streets will still be required to serve areas that will not generate enough traffic to justify a freeway and to bring traffic to the interchange points along the freeway. A description of the various types and uses of major streets will be found in a later section.

MINOR STREETS

The development of freeways will permit accommodation of traffic on a smaller mileage of thoroughfares than would be possible if surface streets were to be used throughout. Consequently there will be a smaller mileage of such thoroughfares under the plan presented herein than was proposed under the 1927 major street plan.

There are many thoroughfares in the area which are classed as minor streets but which carry large volumes of traffic and provide direct channels for local traffic to reach the major streets. Widening of rights-of-way or pavement will not be required, but such streets may need the protection of signs and possibly an occasional traffic light.

The minor streets can be narrow and indirect. Most of them will serve residential property and light traffic on them will enhance residential amenities and promote development of stable residential neighborhoods.


LEGEND
INTERSTATE (EXPRESS) HIGHWAY WITH 6 MOVING (FREEWAY) LANES
FREEWAY WITH 6 FREEWAY LANES 4 SERVICE & 2 PARKING LANES
MAJOR STREET WITH 6 MOVING LANES AND 2 PARKING LANES
MAJOR STREET WITH 4 MOVING LANES AND 2 PARKING LANES
SCALE IN THOUSANDS OF FEET
NORTH
EAST
SOUTH
WEST
MORAGA
ORINDA
ST. MARYS COLLEGE
TO ORINDA AREA
TO MORAGA AREA
TO MORAGA AREA
SKYLINE BLVD
NEW STREET
GRIZZLY PEAK BLVD
PARK BLVD
MOUNTAIN BLVD
MACARTHUR BLVD
MACARTHUR BLVD
LINCOLN AVE
SEMINARY
73RD AVE
82ND AVE
81ST AVE
EAST 14TH ST
SAN LEANDRO ST
HIGH ST
35TH AVE
FRUITVALE AVE
23RD AVE
FOOTHILL BLVD
COLLEGE AVE
SHAFTER
CLAREMONT AVE
ALCATRAZ
ASHBY AVE
TELEGRAPH AVE
BROADWAY
GROVE ST
MARKET ST
ADELINE
SAN PABLO AVE
GRAND AVE
PARK BLVD
14TH AVE
EAST SHORE HIGHWAY
CENTRAL BUSINESS DISTRICT SEE INSERT
22ND
14TH ST
8TH ST
FREEWAY
CLEMENT AVE
LINCOLN AVE
ENCINAL AVE
BROADWAY
PARK ST
HIGH ST
OTIS DR
MAITLAND
NEW STREET
FREEWAY
GRAND ST
9TH
WEBSTER ST
MAIN ST
MIDDLE HARBOR RD
TO SAN FRANCISCO
OAKLAND
ALAMEDA
SAN FRANCISCO
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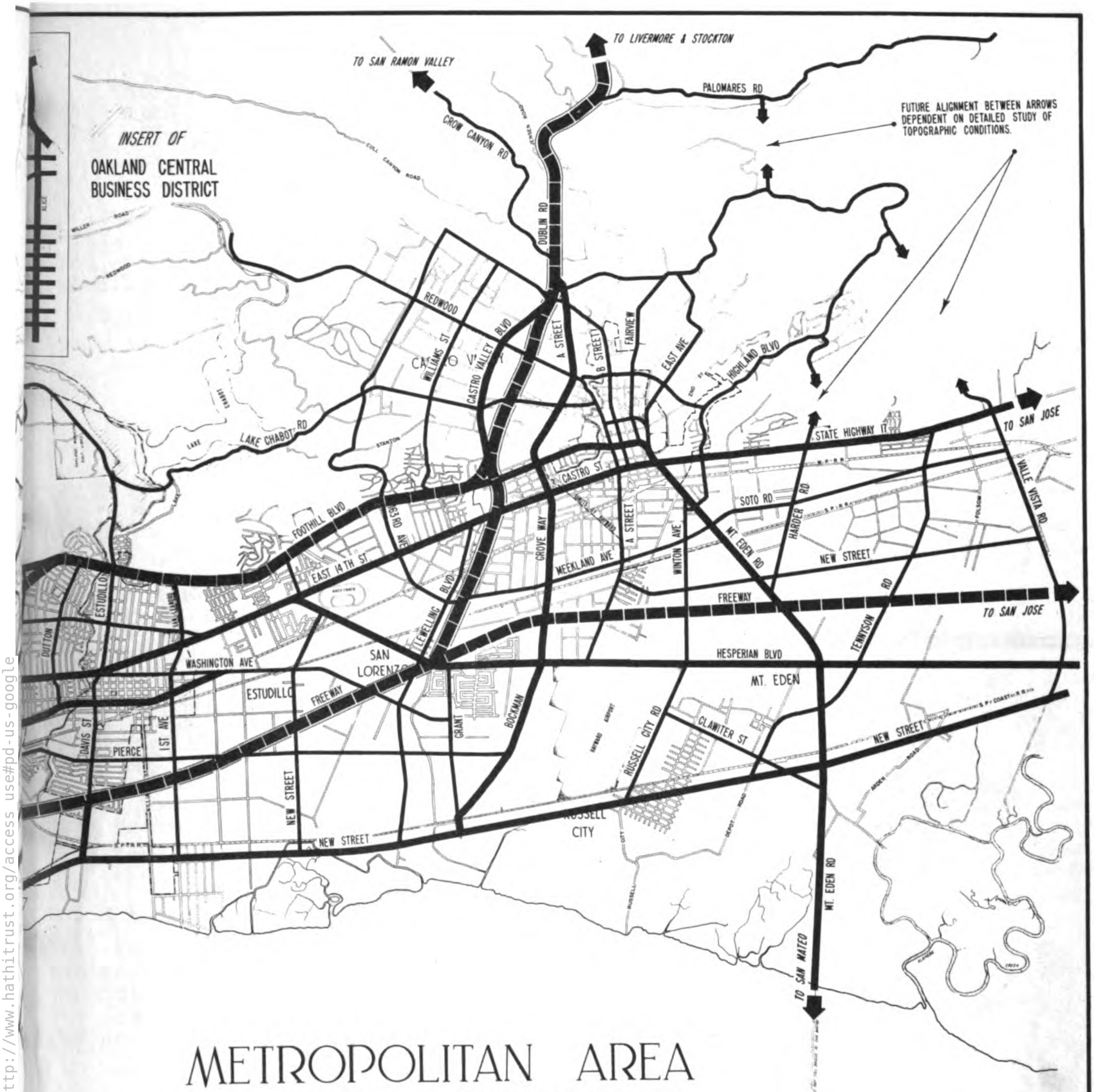


METROPOLITAN AREA
OAKLAND CALIFORNIA

ROPOSED MAJOR STREET AND FREEWAY PLAN

THE CITY PLANNING COMMISSION

HARLAND BARTHOLOMEW AND ASSOCIATES
CITY PLANNERS
ST. LOUIS MISSOURI

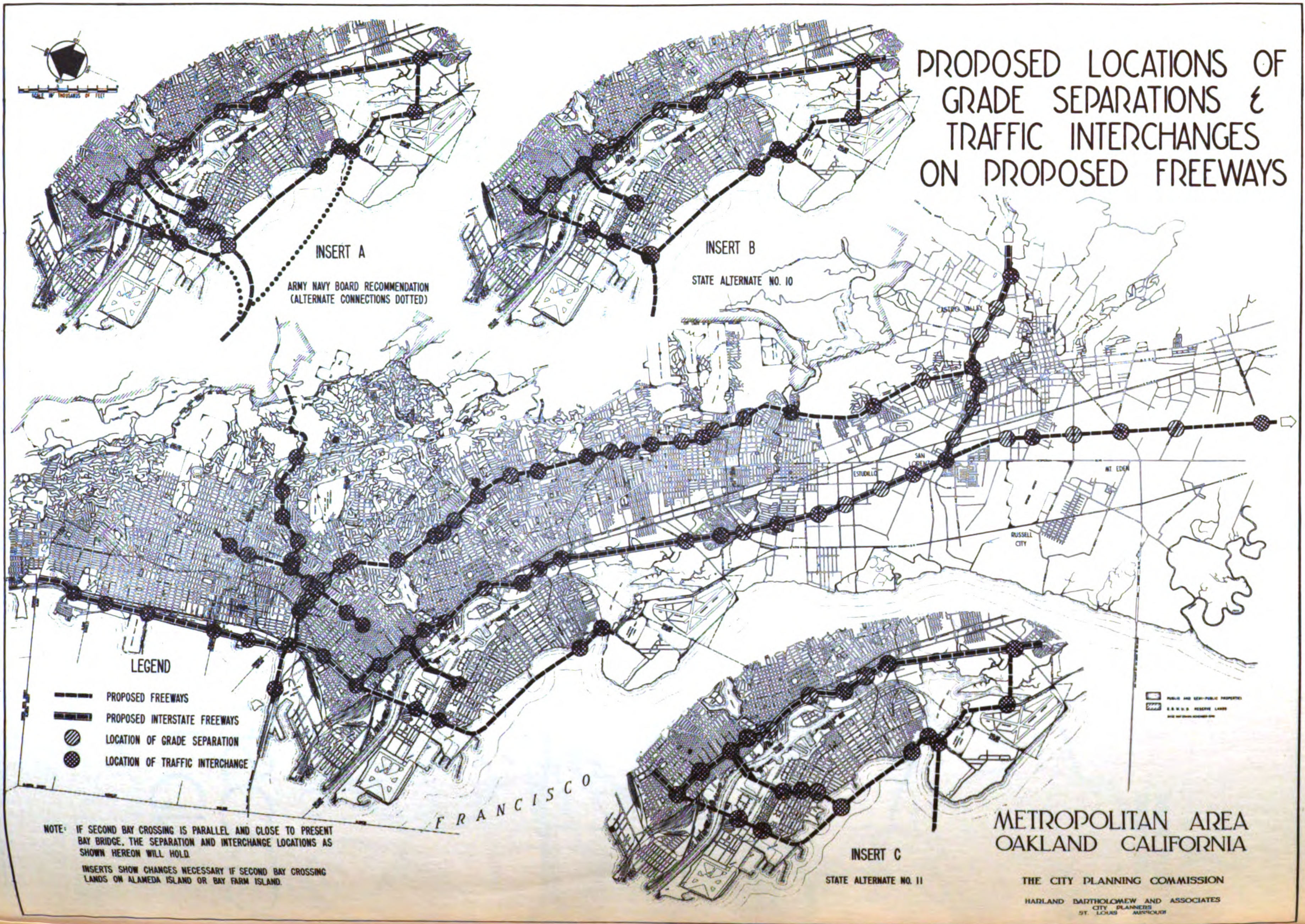
DASHED LINES INDICATE LIMITED ACCESS PORTIONS OF PROPOSED MAJOR STREETS.

☐	PUBLIC AND SEMI-PUBLIC PROPERTIES
☐	E.B.M.U.D. RESERVE LANDS

BASE MAP DRAWN NOVEMBER 1946

PLATE 8

PLATE 9



INSERT A
ARMY NAVY BOARD RECOMMENDATION
(ALTERNATE CONNECTIONS DOTTED)
INSERT B
STATE ALTERNATE NO. 10
INSERT C
STATE ALTERNATE NO. 11
CASTRO VALLEY
SAN LORENZO
ESTUDILLO
MT EDEN
RUSSELL CITY
FRANCISCO
PUBLIC AND SEMI-PUBLIC PROPERTIES
LEGEND
PROPOSED FREEWAYS
PROPOSED INTERSTATE FREEWAYS
LOCATION OF GRADE SEPARATION
LOCATION OF TRAFFIC INTERCHANGE
SCALE IN THOUSANDS OF FEET

PROPOSED LOCATIONS OF GRADE SEPARATIONS & TRAFFIC INTERCHANGES ON PROPOSED FREEWAYS

NOTE: IF SECOND BAY CROSSING IS PARALLEL AND CLOSE TO PRESENT BAY BRIDGE, THE SEPARATION AND INTERCHANGE LOCATIONS AS SHOWN HEREON WILL HOLD.

INSERTS SHOW CHANGES NECESSARY IF SECOND BAY CROSSING LANDS ON ALAMEDA ISLAND OR BAY FARM ISLAND.

METROPOLITAN AREA
OAKLAND CALIFORNIA

THE CITY PLANNING COMMISSION

HARLAND BARTHOLOMEW AND ASSOCIATES
CITY PLANNERS
ST. LOUIS MISSOURI

PROPOSED STREET PLAN

The proposed major street system for Oakland is shown on Plate 8. The Plate also shows the freeway plan for the Oakland Metropolitan Area and extensions of major streets into the districts surrounding the city. Also shown on the Plate are the proposed major street systems in the City of Alameda and the Eden Township area of Alameda County, as proposed for those communities.

The conversion of the present street system to the street system of 1970 is a long-range progressive matter, to be carried out as traffic requirements demand and as funds become available. Some of the suggested improvements are of immediate importance and should be made in the very near future.

The adoption and gradual execution of the plan will enable Oakland to follow a definite program designed to effect over a period of years a well-arranged, safe and efficient system of traffic arteries throughout the entire city area.

There follows a brief discussion of the more significant parts of the proposal and their function in the comprehensive plan.

TRANS-BAY CROSSINGS

The detailed study of the problem of Trans-Bay traffic and recommendations for the location of future Trans-Bay crossings are outside the scope of this Report. Recent studies made by various organizations include investigations of a number of locations and the consideration of several structural types.

Culminating an intensive study of the problem, the State Department of Public Works has recommended to the California Toll Bridge Authority that a parallel high-level bridge be constructed with its eastern terminus just to the north of the present Bay Bridge.

In 1946 the Congress provided for a study of the problem by Federal authorities through a Joint Army-Navy Board. Following exhaustive hearings, the Army-Navy Board concluded that the best solution would be to provide a combination causeway-tube from the vicinity of Army Street in San Francisco to the vicinity of Fifth Street in Alameda with an extension to the Eastshore Freeway in Oakland, and a separate subaqueous tube across the Bay for the exclusive use of rapid transit rail service.

The California Toll Bridge Authority has approved both the parallel and the southern crossing but no decision has been reached as to the priority of construction. Construction on the second Bay crossing is to be started as soon as the location is decided. The third Bay crossing will undoubtedly not be started for some time.

The final decision as to location of the second Bay crossing will influence the sequence of several of the improvements proposed under the Major Street and Freeway Plan shown on Plate 8. The plan has been made flexible and connections can be made to any of the officially proposed Bay crossings without difficulty. The freeways will be the thoroughfares most affected by the location of the second Bay crossing. Plate 9, which shows the freeway locations, contains inserts which indicate the changes in and additional locations of traffic interchanges and grade separations which will be necessary if the second Bay crossing should terminate at locations other than adjacent to the existing San Francisco-Oakland Bay Bridge.

Insert A shows the location of the Southern Bay crossing recommended by the Army-Navy Board and recently approved by the Toll Bridge Authority. The dashed lines show the favored Army-Navy Board proposal. The dotted lines indicate a possible alternate alignment using the proposed Main Street Freeway location in Alameda. Inserts B and C indicate the other most feasible terminal locations for the Southern Bay crossing and their treatment.

In the planning of the second Bay crossing it should be kept in mind that additional crossings will become necessary in the future. These should be so located as to enable traffic to reach the bridgeheads by direct routes, bypassing existing centers of congestion, and leading to those portions of the East Bay which show the greatest future development.

FREEWAY AND INTERSTATE SYSTEM

Shown on Plate 8 are five freeways in addition to two portions of an interstate highway system. Each of these are briefly discussed in the following.

MacArthur Freeway

This is an extremely important route connecting directly with the San Francisco-Oakland Bay Bridge and leading out through East Oakland and the Hayward area to a connection with U. S. Route 50. The MacArthur Freeway is specifically designated in the recently approved State Highway Program and is eligible for Federal aid in addition to gasoline tax refunds and other monies. The importance of this artery as a through route is indicated by comparison of traffic flows over the past ten years. A 24-hour traffic count just west of Broadway on MacArthur showed a total volume of 22,475 vehicles in 1937. This volume increased to 40,812 vehicles in 1941 and to 44,049 vehicles during the 24-hour period in the spring of 1947.

The present MacArthur Boulevard is designated through the metropolitan area as a portion of U. S. Route 50. Consequently, this street carries unusually large volumes of traffic from the suburban areas to portions of Oakland as well as to the Bay Bridge. During the past few years the improvement of this highway across California and the States to the east has popularized this route for transcontinental travel. At present, the alignment is awkward in a number of locations in Oakland and the development of local shopping centers, such as the Dimond and Laurel districts, have attracted considerable volumes of purely local traffic to the through route.

As shown on Plate 8, MacArthur Boulevard has been designated for improvement as a freeway to provide six lanes reserved exclusively for through traffic movement. A suggested freeway cross section is shown on Plate 10 (page 28).

In the Report on Transit Facilities and Mass Transportation, recommendations were made that in the design of the MacArthur Freeway there should be provision for adequate space for construction of rapid transit rail facilities.

Grove-Shattuck Freeway

There is need for a freeway connection between the Berkeley Central Business District and the Oakland Central Business District. The proposed location follows Grove Street between 22nd Street and approximately 42nd Street, then Dover Street connecting with Adeline at about Woolsey Street in Berkeley, then follows Adeline and Shattuck to the vicinity of University Avenue in the Berkeley business district. Space for rapid transit rails should be provided in this freeway in order to permit speedy transportation between Berkeley and the Oakland Central Business District, and connections could be made via MacArthur to the present Bay Bridge.

Shafter Avenue Freeway

Plate 8 shows the proposed location of a freeway connecting the Grove Street Freeway with the Broadway Tunnel utilizing Shafter Avenue for a portion of the distance. The completion of the Shafter Avenue Freeway and the Grove Street Freeway will provide a reasonably direct thoroughfare for traffic moving between Contra Costa County and the Oakland Central Business District. Construction of this freeway will remove a great deal of the traffic congestion from Broadway and will also permit Contra Costa County traffic to reach the Bay

Bridge, the Eastshore Highway, and the Eastshore Freeway (by traveling on the MacArthur Freeway between Grove and the Bay Bridge distribution structure) without the necessity of utilizing surface streets near the congested central area of Oakland. Construction of the proposed Main Street Tube under the Estuary (with possible alternate alignments as indicated on Insert A of Plate 9) will also permit traffic from Alameda destined for Contra Costa County to bypass the surface streets in the Oakland central area.

The recently approved State Highway Program includes a connection between the City of Alameda and Contra Costa County. No specific location is designated. The importance of eliminating heavy volumes of through traffic from the congested central area of Oakland offers ample justification for construction of the Shafter Avenue-Grove Street Freeway, and the proposed tunnel from Main Street in Alameda to 7th and Cypress Streets in Oakland, or one of the alternate routes as shown on Insert A, plate 9.

Main Street-Southshore Freeway

Future plans for the development of the south shore area in Alameda contemplate the reclaiming of a considerable area along the south side of the City of Alameda. Included in the proposal for development is the construction of a freeway in the location shown on Plate 8. Under present conditions, this freeway should be extended to follow Main Street and through the proposed Main St. Tube under the Estuary to connect with the Eastshore Freeway in the vicinity of 7th and Cypress Streets in Oakland. Future developments in the location of the Southern Bay crossing which is proposed to land in the vicinity of 5th Street in Alameda may necessitate certain revisions in alignment as mentioned earlier. Construction of this improvement will afford an uncongested routing for traffic between Alameda and San Francisco, between Alameda and East Bay cities north of the Bay Bridge, and will afford an important connection to the Oakland Airport and to the industrial areas slated for improvement by the Port of Oakland.

Webster Street Freeway in Alameda

Plate 8 shows a freeway on the present location of Webster Street in Alameda between the present Posey Tube and the proposed Webster Street Tube to the vicinity of Bainbridge Street. This artery will permit uninterrupted movement of through traffic between the tubes and the Lincoln Avenue-Atlantic Avenue traffic interchange in Alameda.

Interstate Routes

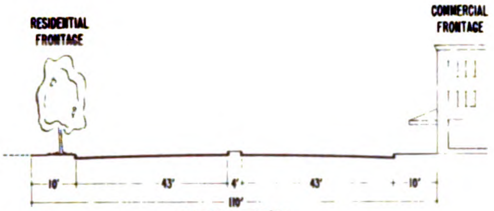
Within the Oakland Metropolitan Area there are two designated portions of the Interstate Highway System - (1) the present Eastshore Highway leading north from the San Francisco-Oakland Bay Bridge through Berkeley and Richmond and along the Bay shore (this is to be reconstructed to interstate standards); and (2) the Eastshore Freeway leading southward from the San Francisco-Oakland Bay Bridge to an extension of the present U. S. Route 50 near Dublin Canyon. This will be the location of Interstate Highway 50 within the Oakland Metropolitan Area. Portions of the route are now under construction. A new route extending southward from Interstate Route 50 near San Lorenzo Village, planned to eventually reach San Jose, is shown on the Plan as a freeway, but local requests have been made that this be included in the interstate system. A typical section embodying accepted standards for interstate route construction is shown on Plate 10. Recommended locations for grade separation structures and traffic interchanges are shown on Plate 9.

MAJOR STREETS

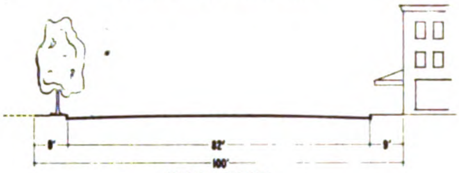
There are two types of major streets proposed on the Major Street and Freeway Plan, one with 6 moving lanes of traffic and one with 4 moving lanes. The expected volume of future traffic is the determining factor in locating these major streets and the future flow determines the number of lanes necessary to handle that volume. Typical cross sections for the several types of major streets are shown on Plate 10 (page 28) and an explanation of these cross sections is made in a later section of this report.

TYPICAL CROSS SECTIONS

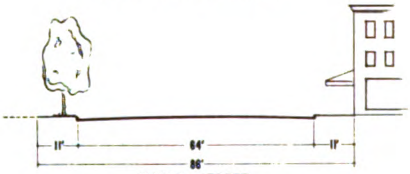
OAKLAND CALIFORNIA



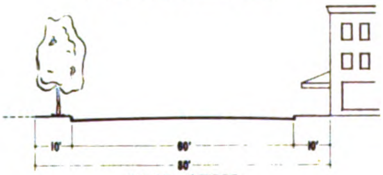
MAJOR STREET
WHERE R-O-W IS TO BE EXTENDED OR WIDENED
6 MOVING LANES - 2 PARKING LANES



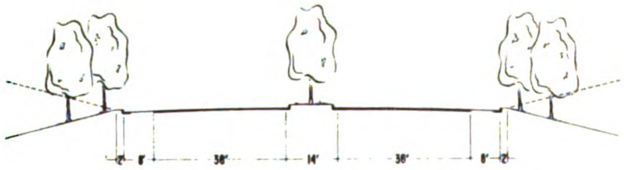
MAJOR STREET
FOR EXISTING R-O-W WITH DEVELOPED FRONTAGE
6 MOVING LANES - 2 PARKING LANES



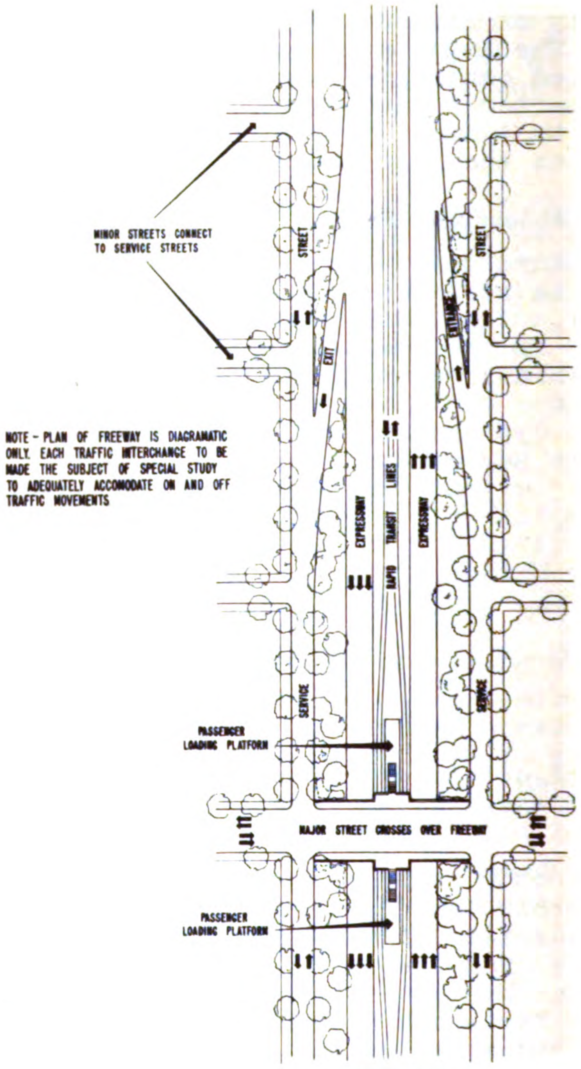
MAJOR STREET
WHERE R-O-W IS TO BE EXTENDED OR WIDENED
4 MOVING LANES - 2 PARKING LANES



MAJOR STREET
FOR EXISTING R-O-W WITH DEVELOPED FRONTAGE
4 MOVING LANES - 2 PARKING LANES



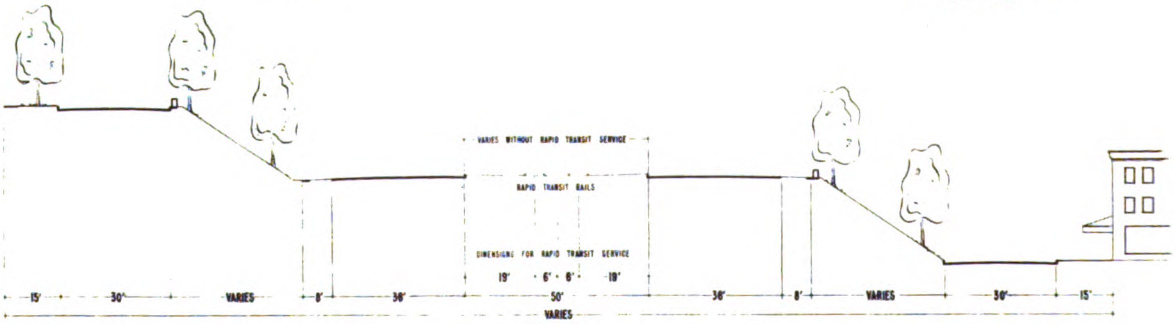
INTERSTATE (EXPRESS) HIGHWAY
6 MOVING LANES


MINOR STREETS CONNECT TO SERVICE STREETS
STREET
EXIT
ENTRANCE
EXPRESSWAY
RAPID TRANSIT LANES
SERVICE
PASSENGER LOADING PLATFORM
MAJOR STREET CROSSES OVER FREEWAY

NOTE - PLAN OF FREEWAY IS DIAGRAMATIC ONLY. EACH TRAFFIC INTERCHANGE TO BE MADE THE SUBJECT OF SPECIAL STUDY TO ADEQUATELY ACCOMODATE ON AND OFF TRAFFIC MOVEMENTS

FREEWAY PLAN
6 MOVING FREEWAY LANES - 4 MOVING SERVICE LANES - 2 PARKING LANES
WITH PROVISION FOR RAPID TRANSIT FACILITIES

0 50 100 150 200
SCALE IN FEET


VARIES WITHOUT RAPID TRANSIT SERVICE
RAPID TRANSIT RAILS
DIMENSIONS FOR RAPID TRANSIT SERVICE
19'
6'
6'
19'
15'
30'
VARIES
8'
36'
50'
36'
8'
VARIES
50'
15'
VARIES

FREEWAY
6 MOVING FREEWAY LANES - 4 MOVING SERVICE LANES - 2 PARKING LANES
WITH PROVISION FOR RAPID TRANSIT FACILITIES

HARLAND BARTHOLOMEW AND ASSOCIATES CITY PLANNERS ST. LOUIS MISSOURI

PLATE 10

Original from UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

It will be noted that there are a number of east-west major streets (such as 82nd, 73rd, Seminary, 35th and 23rd Avenues) which are proposed to accommodate 4 lanes of moving traffic and 2 lanes for parking. Although the plan shows the desirable type of development for these streets, it may be found that the expense of widening to the full 80 foot right-of-way will be too great to economically justify it for the amount of traffic that will be benefited. It may, therefore, be necessary to develop these streets with a somewhat narrower right-of-way and still obtain the necessary 4 lanes for moving traffic by the elimination of all parking, especially during the morning and evening rush periods. While this is decidedly not desirable, it may become an economic necessity. The final determination as to the exact type of development will depend upon population growth, increase in traffic volumes and a careful cost analysis. In any event, such widenings should be postponed until the important and heavily travelled radials and freeways are fully improved.

Although the development of 42nd Avenue from Courtland to the Eastshore Freeway is shown on Plate 8 as a 6 lane major street, it will be similar to the freeway construction from Foothill Boulevard to the Freeway since there will not be any access to it except by interchanges which will be located at E. 14th and E. 12th Streets. The Foothill, Courtland and High Street intersections will be simplified and controlled with proper channelization measures.

A variation in the usual construction of the 6 lane major street is proposed for the portions of Foothill Boulevard and East 12th Street between Lake Merritt and 42nd Avenue. These two portions are to be developed with a "limited access" type of construction in order to increase the traffic capacity to approximately 800 vehicles per lane per hour. The limited access development will limit the number of grade crossings on the major streets to about one-fourth the present number, controlling the entering and cross traffic with lights and allowing the traffic on the major street to flow, under a progressive traffic light control, at a greater speed and with less interference than would be possible on the regular 6 lane major street with all the intersections at grade.

An alternate alignment to the one shown on Plate 8 for Foothill Boulevard could be obtained by opening a new 6 lane major street through from the intersection of Foothill and 23rd Avenue, along the approximate alignment of 16th Street, to a connection with 42nd Avenue and High Street. The selection of one or the other of the alignments will depend on the events that occur between now and the time of development and on a careful analysis of the cost of each. Either one could be developed to satisfactorily care for the future traffic.

The possibility of developing an entirely new street to serve in lieu of Foothill Boulevard has been considered. This would have an alignment somewhere between the present MacArthur Boulevard and E. 14th Street from Park Boulevard to 82nd Avenue. It would provide a heavily traveled 6 lane major street through the center of a residential area, isolating the school and recreational facilities and not necessarily giving the area any better service than it now enjoys, or would enjoy, under the improvements shown on the plan.

STREET CROSS SECTIONS

On Plate 8 the major streets are shown by two designations. The heavier solid lines indicate streets having six moving traffic lanes and two parking lanes. The lighter solid lines show streets with four moving traffic lanes and two parking lanes. Freeways are indicated by heavy dashed lines.

Plate 10 shows recommended pavement and sidewalk widths for streets having various right-of-way widths. Since there is a considerable variation in right-of-way widths on streets in Oakland and in the character of traffic to be accommodated, the discussions in this report with respect to traffic capacity are based on the number of traffic lanes available rather than with the overall dedicated street right-of-way. For example, there are two sections shown for a major street to provide six moving lanes and two parking lanes. Where a new street is to be opened or an existing narrow right-of-way to be substantially widened, the street should be designed with two twelve foot and one eleven foot traffic lanes and one eight foot parking lane in each direction, with a median strip separating opposing streams of traffic and with a ten-foot space for sidewalk between the curb and the property line. In this case, the total right-of-way width would be 110 feet.

Many streets in Oakland now have an established right-of-way width of 100 feet. Where frontage has been improved, particularly with commercial buildings, the expense of widening this right-of-way would be out of proportion to the benefits derived from the inclusion of a median strip in the pavement and the provision of traffic lanes wider than eleven feet and sidewalks wider than nine feet. Without increasing the right-of-way width, it is possible to provide a pavement having six eleven-foot traffic lanes and two parking lanes. The traffic capacity of such a pavement closely approaches that of the wider section discussed above. However, traffic control measures must be more thorough to provide adequate safety for pedestrian crossings.

Plate 10 also shows two sections to be used for a street having four moving traffic lanes and two parking lanes. The wider right-of-way should be obtained where a new street is to be opened or a narrow right-of-way substantially widened.

The interstate highways are designed to provide for six twelve-foot lanes for moving traffic, with opposing streams of traffic separated as widely as possible. No parking lanes are provided, the wide shoulder being designed to afford a refuge where vehicles may clear the roadway in case of breakdowns. Federal standards require long sight distances, easy gradients, and permit higher speeds than are practicable on surface streets with the same number of traffic lanes.

ADEQUACY OF THE PROPOSED PLAN

The freeways and interstate highways shown on Plate 8 will serve the Oakland Metropolitan Area with only slight modifications with the second Bay crossing constructed at any of the locations proposed. The priority of construction of the urban freeways will be affected by the Bay crossing location which is eventually selected.

Access to Alameda

Plate 8 shows a second tube under the Estuary from Oakland connecting with the Webster Street Freeway in Alameda. This project is desperately needed and now seems assured since its recent designation as a part of the State Highway System. An additional crossing under the Estuary is proposed to connect Main Street in Alameda with the Eastshore Freeway near 7th and Cypress Streets in Oakland. This may be revised as indicated on Plate 9 depending on future developments in the location of the Southern Bay Bridge crossing.

The plan recommends that a six-lane major street connect the Port of Oakland industrial area near the airport, with Alameda.

Access to Berkeley and the Northeast

Under the recommendations of the Plan, the Grove-Shattuck Freeway will provide adequate facilities for through traffic between Berkeley and the Oakland Central Business District. Improved surface streets such as San Pablo, Telegraph and Broadway and their connections as shown on Plate 8 will provide adequate supplementary thoroughfares for local movements to and from the business district.

By 1970 the estimated traffic seeking to leave the business district in the San Pablo-Webster sector during the evening peak hour will amount to 8,100 vehicles. The streets available for this movement will include:

San Pablo Avenue	3 lanes @	500 vehicles	- 1,500
Grove Street Freeway	3 lanes @	1250 vehicles	- 3,750
Grove Street (surface)	2 lanes @	550 vehicles	- 1,100
Telegraph Avenue	3 lanes @	500 vehicles	- 1,500
Broadway	3 lanes @	550 vehicles	- 1,650
Webster.	2 lanes @	500 vehicles	- 1,000
		Total	10,500

This indicates ample street capacity in this area for the expected traffic movements.

Access to the East

The planning of facilities for traffic movements to the east from the central business district divides into two parts: those above Lake Merritt and those below the Lake.

Above Lake Merritt

Above the Lake the proposed improvement of MacArthur as a six-lane freeway with no crossings at grade will greatly increase the capacity over the present roadway. With the new MacArthur being elevated over Grand and Lakeshore Avenues, the present surface streets now used by this route would be available to facilitate traffic movements in this section. Thus there would be three lanes for the eastward movement of traffic on the MacArthur Freeway and three lanes on the present MacArthur Boulevard. Santa Clara-Lake Park Avenue would remain as a surface street and, with parking prohibited between Lakeshore and Van Buren, would provide three free moving lanes for eastward traffic. The future capacity of roadways at this critical point would be summarized as follows:

MacArthur Freeway.	3 lanes @ 1250 vehicles	- 3,750
MacArthur Boulevard (surface).	3 lanes @ 600 vehicles	- 1,800
Santa Clara-Lake Park Avenue	3 lanes @ 600 vehicles	- 1,800
Embarcadero.	3 lanes @ 600 vehicles	- 1,800
	Total	9,150

The above analysis indicates adequate capacity for the expected peak hour traffic of 8,500 vehicles which will cross above Lake Merritt.

Below Lake Merritt

Below Lake Merritt, the problem becomes much more complicated. Under existing plans the Eastshore Freeway will have available three traffic lanes for the eastward movement; 8th Street and 10th Street will each provide two traffic lanes for this movement. Under the plan adopted by the City Council in 1946 and 1947 for the improvement of the 12th Street Dam, six traffic lanes are allocated for eastward traffic movement north of the Municipal Auditorium. The capacity of these roadways is estimated as follows:

Eastshore Freeway.	3 lanes @ 1250 vehicles	- 3,750
8th Street	2 lanes @ 650 vehicles	- 1,300
10th Street.	2 lanes @ 650 vehicles	- 1,300
12th Street Dam.	2 lanes @ 650 vehicles	- 1,300
12th Street Dam.	4 lanes @ 1000 vehicles	- 4,000
	Total	11,650

This analysis indicates that by 1970 the above facilities will not be sufficient to carry the estimated eastward movement during the evening rush hour. The difference of 2,350 vehicles between the estimated 1970 peak hour flow and the estimated 1970 capacity of the proposed facilities will require additional roadways. There are several possibilities for providing additional roadways through this constricted area. Widening of 8th Street and 10th Street would increase the traffic capacity of those arteries immediately below Lake Merritt but would force traffic to move by circuitous routes through and around the central business district. Provision of additional lanes on the 12th Street Dam in addition to those in the adopted plan would not solve the problem since under the adopted plan the capacity of the Dam will be greater than the traffic capacity of the approaches to the 12th Street Dam.

With rush hour parking eventually prohibited on the south side of 14th Street, and on both sides of 13th Street, and with 13th Street designated as one-way eastbound (and 12th Street one-way westbound) the traffic lanes available for eastward movement during the evening peak hour would be:

14th Street.	3 lanes	@ 550 vehicles	- 1,650
13th Street.	4 lanes	@ 550 vehicles	- 2,200
11th Street.	2 lanes	@ 550 vehicles	- 1,100
		Total	4,950

If streetcar tracks are located on 11th Street, the total capacity of tributary east and west streets would be reduced to approximately 4,850 vehicles. In comparison, the capacity of the 12th Street Dam is 5,300 vehicles per hour for eastward movement under the plan adopted by the City Council.

Below 11th Street, the present eastbound traffic at peak hour using 10th Street and 8th Street totals 2,815 vehicles. Applying the factor of 2.3 for the increase by 1970 means that 6,500 vehicles must be accommodated. As listed above, the capacities of 10th and 8th Street total 2,600 vehicles. The east bound lanes on the Eastshore Freeway will accommodate 3,750 vehicles. These three facilities will provide for the movement of 6,350 vehicles - very close to the estimated 6,500 vehicles by 1970.

On Oak Street above 14th Street, the 1947 traffic in both directions during a 24-hour period totaled 23,000 vehicles. The south and eastbound portion during the evening peak hour was 1,410 vehicles. Traffic south on Oak and Fallon Streets amounted to 100 and 285 vehicles respectively or a total of 385. The balance - or 1,025 vehicles - moved eastward across the 12th Street Dam.

By 1970 this portion of the eastbound traffic will increase to 2,350 vehicles during the peak hour. This traffic amounts to almost exactly the excess of 1970 traffic over the total capacity of the Eastshore Freeway, 8th Street, 10th Street and the officially adopted plan for the improvement of the 12th Street Dam. It is this traffic - originating above 14th Street - which should be served by providing an additional entry to the east from the upper portion of the central business district.

In order to attain the rated capacity of 1,000 vehicles per lane per hour as used above in estimating the capacity of the traffic lanes on the proposed 12th Street Dam improvement, future cross traffic would have to be eliminated. Separation of traffic moving from the 12th Street Dam into 12th Street (which is designated as one way to the west on the officially adopted plan) will be necessary where this traffic crosses over eastbound traffic coming from 14th and 13th Street. A separation structure should also be provided to eliminate the conflict at the eastern end of the Dam between traffic moving eastward up First Avenue and traffic moving westward out of East 12th Street and onto the 12th Street Dam. The basic design of the officially adopted plan is satisfactory.

The following tabulation shows the capacities of major streets (under the major street plan now in preparation) to carry traffic eastward from around the lower end of Lake Merritt during the evening peak hour.

Eastshore Freeway.	3 lanes	@ 1250 vehicles	- 3,750
East 8th Street.	2 lanes	@ 550 vehicles	- 1,100
East 10th Street	2 lanes	@ 550 vehicles	- 1,100
East 12th Street (limited access). . .	3 lanes	@ 800 vehicles	- 2,400
East 14th Street	2 lanes	@ 550 vehicles	- 1,100
Lakeshore Avenue	3 lanes	@ 550 vehicles	- 1,650
Foothill Boulevard (limited access). .	3 lanes	@ 800 vehicles	- 2,400
Park Boulevard	3 lanes	@ 550 vehicles	- 1,650
		Total	15,150

The 1970 estimated traffic is 14,000 vehicles indicating that the proposed major streets east of the Lake would be adequate to carry away the peak hour eastbound traffic.

Analysis of traffic movements for the peak hour show that Foothill Boulevard, East 18th-Park Boulevard and Lakeshore Avenue carry nearly 2,700 vehicles eastbound. This movement is obviously destined for areas north and east of Lake Merritt and above East 14th Street. If this traffic could be removed from thoroughfares below Lake Merritt, these thoroughfares (i.e. Eastshore Freeway, East 8th Street, East 10th Street and the proposed 12th Street Dam improvement) would be able to handle the outbound movement. The movement onto Foothill, East 18th-Park Boulevard and Lakeshore Avenue is slightly more than the movement which was found to originate on the west side of the Lake north of 14th Street.

The solution to the problem would be a route across Lake Merritt to serve traffic which desires to enter or leave the central business district above 14th Street. This would include that traffic which now originates at 17th Street or above on the west side of the Lake, follows around the lower end of the Lake and proceeds north and eastward using Lakeshore Avenue, Foothill Boulevard and East 18th-Park Boulevard. The future additional crossing of Lake Merritt should connect Foothill Boulevard with 17th and 19th Streets near Lakeside Drive as shown on Plate 11. The structure will probably not be needed for the next ten or fifteen years but eventually should provide for six traffic lanes and two sidewalks. By good design such a crossing need not detract from the beauty of Lake Merritt. The Arlington Memorial Bridge across the Potomac has not detracted from, but has added to, the beauty of Washington.

Lakeshore Avenue and Lakeside Drive could be carried under the proposed structure. On the east side of the Lake, access to the crossing could be comparatively simple with minor adjustments of existing streets. Fortunately the topography at each end of the structure lends itself to overcrossings of Lakeshore Avenue and Lakeside Drive without the necessity for expensive relocations of those important thoroughfares.

STREET IMPROVEMENTS WITHIN CENTRAL BUSINESS DISTRICT

In a previous report on Off-Street Parking and Traffic Control in Oakland Business Districts, it was recommended that three intersections within the central business district be channelized to reduce traffic congestion during peak hours.

Inclusion of the Grove Street Freeway in the Major Street and Freeway Plan will delete the suggested channelization at Grove-San Pablo since a separation of some complicated traffic movements can be attained by proper design of approaches to the Grove Street Freeway from the business district. The suggested treatment of this problem is shown on Plate 11.

Channelization, Broadway-Franklin-21st Street

Designation of 21st as a one-way street westbound affords an opportunity for channelization and consequent simplification of traffic movement through this intersection.

Channelization, Harrison-Alice-Lakeside Drive-20thStreet

The proposed extension of Alice Street to 20th Street and the growing importance of 20th Street as a through artery across the upper portion of the central business district, will attract an increasing volume of traffic through this intersection. Channelization is imperative in order to avoid congestion. The suggested layout permits continuous flow of traffic northbound on Lakeside Drive and also of vehicles moving southward along Harrison to westward on 20th Street.

PROPOSED STREET IMPROVEMENTS

THE CENTRAL BUSINESS AREA
OAKLAND CALIFORNIA

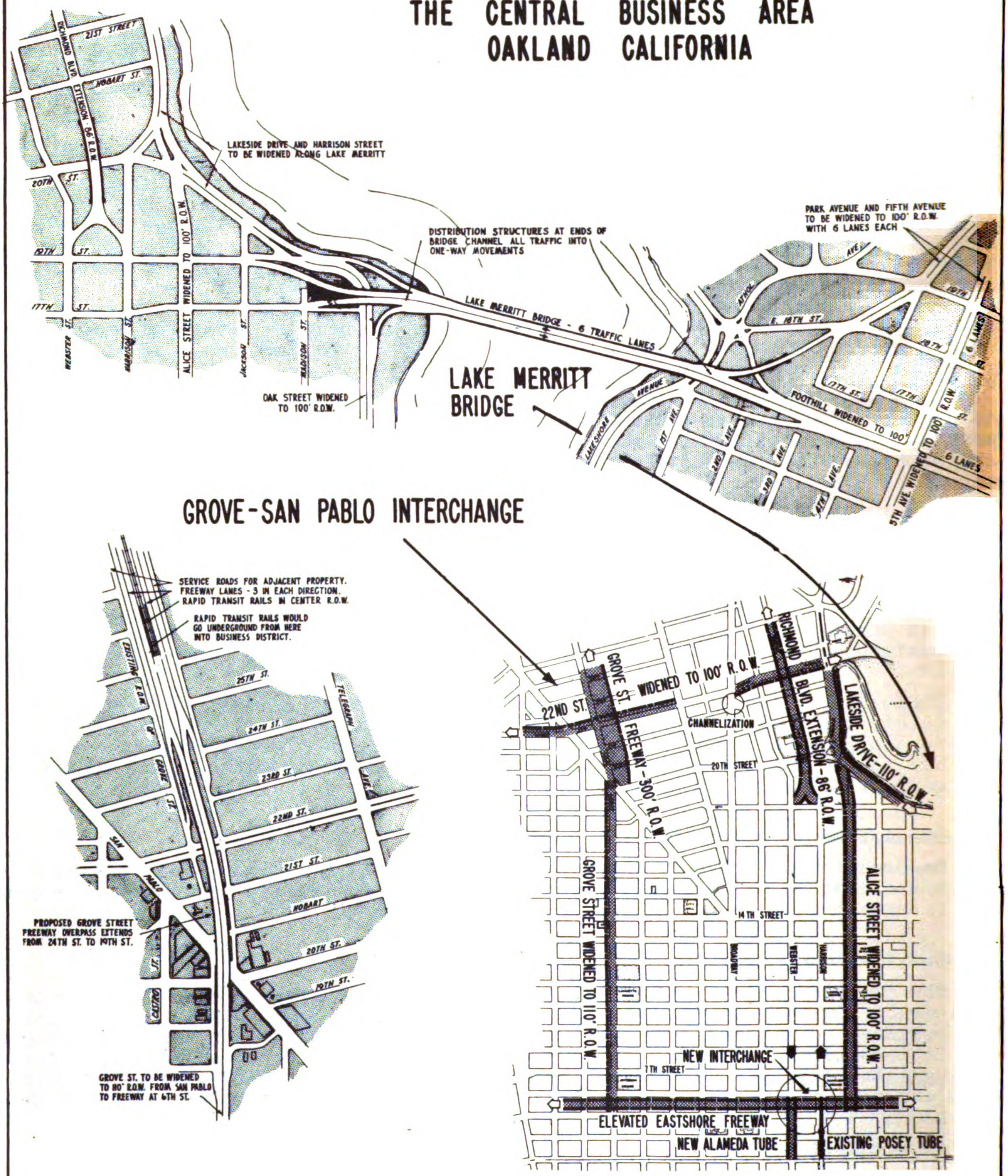

21ST STREET
RICHMOND BLVD. EXTENSION-86' R.O.W.
HOBART ST.
LAKESIDE DRIVE AND HARRISON STREET TO BE WIDENED ALONG LAKE MERRITT
20TH ST.
19TH ST.
17TH ST.
WEBSTER ST.
HARRISON ST.
ALICE STREET WIDENED TO 100' R.O.W.
JACKSON ST.
MADISON ST.
OAK STREET WIDENED TO 100' R.O.W.
DISTRIBUTION STRUCTURES AT ENDS OF BRIDGE CHANNEL ALL TRAFFIC INTO ONE-WAY MOVEMENTS
LAKE MERRITT BRIDGE - 6 TRAFFIC LANES
LAKE MERRITT BRIDGE
PARK AVENUE AND FIFTH AVENUE TO BE WIDENED TO 100' R.O.W. WITH 6 LANES EACH
AVE.
ATHOL
E. 18TH ST.
10TH
19TH
6 LANES
17TH ST.
17TH
FOOTHILL WIDENED TO 100'
R.O.W.
ST.
LAKESHORE AVENUE
1ST AVE.
2ND AVE.
3RD AVE.
4TH AVE.
5TH AVE. WIDENED TO 100' R.O.W.
6 LANES
GROVE-SAN PABLO INTERCHANGE
SERVICE ROADS FOR ADJACENT PROPERTY.
FREEWAY LANES - 3 IN EACH DIRECTION.
RAPID TRANSIT RAILS IN CENTER R.O.W.
RAPID TRANSIT RAILS WOULD GO UNDERGROUND FROM HERE INTO BUSINESS DISTRICT.
EXISTING R.O.W. OF GROVE ST.
25TH ST.
24TH ST.
23RD ST.
22ND ST.
21ST ST.
HOBART
20TH ST.
19TH ST.
TELEGRAPH AVE.
SAN PABLO
CASTRO ST.
PROPOSED GROVE STREET FREEWAY OVERPASS EXTENDS FROM 24TH ST. TO 19TH ST.
GROVE ST. TO BE WIDENED TO 110' R.O.W. FROM SAN PABLO TO FREEWAY AT 6TH ST.
22ND ST.
GROVE ST.
WIDENED TO 100' R.O.W.
CHANNELIZATION
RICHMOND BLVD. EXTENSION-86' R.O.W.
LAKESIDE DRIVE-110' R.O.W.
20TH STREET
FREEWAY-300' R.O.W.
GROVE STREET WIDENED TO 110' R.O.W.
14TH STREET
BROADWAY
WEBSTER
HARRISON
ALICE STREET WIDENED TO 100' R.O.W.
NEW INTERCHANGE
7TH STREET
ELEVATED EASTSHORE FREEWAY
NEW ALAMEDA TUBE
EXISTING POSEY TUBE

PLATE 11

Widening of Distributor Streets

The widening of three distributor streets at the edges of the central business district is recommended in the Plan. These are: Grove Street from 6th to San Pablo, 22nd Street-Grand Avenue across the upper end of the business district, and Alice Street from 6th to 19th, together with the extension of Alice Street to 20th. These improvements are shown on Plate 11.

Richmond Boulevard

This improvement is designed to afford traffic relief to Broadway above 20th Street and, by its connections to Webster and Harrison, to provide convenient routes through the business district for traffic to and from the present Posey Tube at the foot of Harrison Street and the proposed tube to Alameda from the foot of Webster Street. Carrying Richmond Boulevard over 20th Street as shown on Plate 11 will eliminate congestion due to cross traffic at this point. In the previous report on Off-Street Parking and Traffic Control, construction of a parking garage was recommended on the block bounded by Webster, Harrison, 19th and 20th. This facility can be combined with the separation structure at the terminus of Richmond Boulevard and will provide terminal parking for vehicles entering the business district at this point.

Lake Merritt Crossing

Plate 11 shows the recommended location and general treatment of the approaches for a bridge across the Lake as discussed earlier in this report. East of Alice Street the plan contemplates the use of 17th Street one-way eastward and 19th Street one-way westward. A connection from the bridge to Lakeside Drive is provided for westbound traffic. At the eastern end of the structure a connection is provided between Park Boulevard at East 19th Street and the bridge for traffic moving from Park Boulevard to the business district.

Eastshore Freeway

Below the business district, the Eastshore Freeway will provide a separated route for through traffic as well as a bypass route for local traffic seeking to avoid business district congestion. Interchanges would be provided at Fallon Street, at the Oakland end of the tubes to Alameda, and at Market Street. One-way local service streets should be provided in addition to the freeway to function as distributor streets between the business district and the freeway. As recommended in the parking report, ground-level parking for an estimated 1,800 cars would be provided underneath the Eastshore Freeway elevated structure.

OTHER MAJOR FEATURES OF THE PLAN

The Plan, as shown on Plate 8, has been designed to give the Oakland area a network of traffic arteries so located as to best serve the present and future growth of the City and the surrounding areas.

Streets such as San Pablo, Telegraph, and Broadway will continue to be important in the future. Foothill Boulevard, Park Boulevard, Mountain Boulevard, East 14th Street, San Leandro Boulevard, and the new streets to serve future residential and industrial growth in the hill areas, and in East Oakland and Eden Township will assume increasing traffic burdens as the Oakland Metropolitan Area becomes more intensively developed. If traffic continues to increase beyond the volumes now anticipated the capacity of the proposed system can be substantially increased by elimination of parking during peak hour movements.

In addition to the thoroughfares shown on the Proposed Major Street Plan, there are many streets which serve to collect traffic from residential areas and disburse it into the major arteries. Several of these streets are shown on the present City of Oakland Official Plan of Streets of Major Importance (Plate 2). As the City develops these are subject to change depending on the type of growth and changing focal points of traffic, congestion on other routes, condition of pavement, and other factors.

FINANCIAL CONSIDERATIONS AND SUGGESTED PROGRAM

OVERALL COST ESTIMATES

With the present conditions which exist in the material and labor market, and the uncertainties of the real estate market, it is very difficult to make an estimate of costs for improvements which are to be developed over a long period of time and in a sequence not yet determined.

At the present time costs of all types of construction are fluctuating with the trend generally upward. Therefore, any present estimates of costs for such a program as proposed in this report would undoubtedly prove to be of little value within a very short period. It is recommended that, in order to keep an interest and constant surveillance of the proposed program, initial and periodic estimates of improvement costs be made by the City Planning Commission or other designated city office. This will insure having current estimates at the time that they are needed and will provide an accurate picture of financial needs regardless of revisions in the Plan.

COST OF FREEWAY PROGRAM

The freeway cost estimates tabulated below should be considered as approximations only. These improvements are costly but they will increase in cost the longer they are delayed.

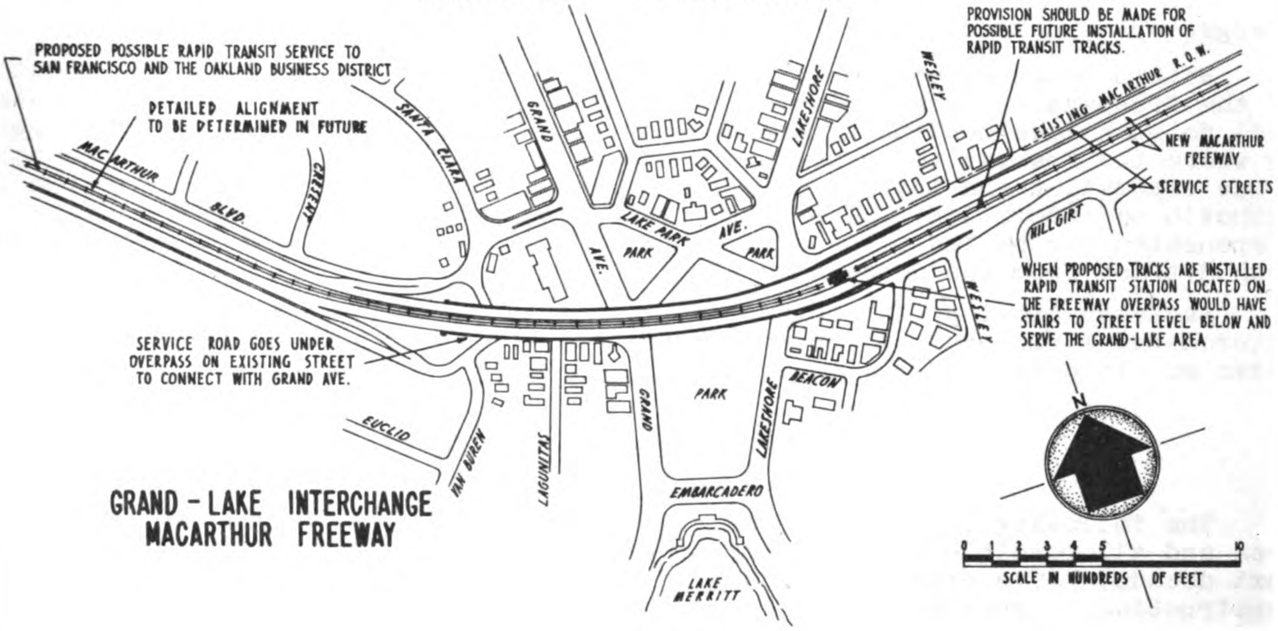
Costs on the first four items are as prepared by the State Division of Highways for the 1946-1956 Deficiency Program. The estimates on the Southshore-Main Street Freeway and the Webster Street Freeway in Alameda are based on data prepared by the State and the East Bay Engineers' report of January 1947 to the Division of Highways.

Name of Improvement	Estimated Cost
Eastshore Highway (Distribution Structure to Richmond City Limits)	$9,000,000
Eastshore Freeway (Distribution Structure to East of Hayward on U. S. Route 50)	29,300,000
Connection - (Eastshore Freeway to south County line)	9,400,000
MacArthur Freeway (Distribution Structure to Castro Valley Road)	47,500,000
Grove-Shattuck Freeway (San Pablo Avenue to Ashby Avenue)	12,000,000
Shafter Avenue Freeway (Grove Street to Broadway)	5,600,000
Southshore-Main Street Freeway (Maitland Drive to 7th and Cypress)	38,000,000
Webster Street Freeway in Alameda (Atlantic Avenue to 6th Street in Oakland-this will include a new tube parallel to the present Posey Tube)	10,000,000
Total	$160,800,000

SKETCHES OF

TYPICAL FREEWAY INTERCHANGES

OAKLAND CALIFORNIA



PROPOSED POSSIBLE RAPID TRANSIT SERVICE TO SAN FRANCISCO AND THE OAKLAND BUSINESS DISTRICT

DETAILED ALIGNMENT TO BE DETERMINED IN FUTURE

PROVISION SHOULD BE MADE FOR POSSIBLE FUTURE INSTALLATION OF RAPID TRANSIT TRACKS.

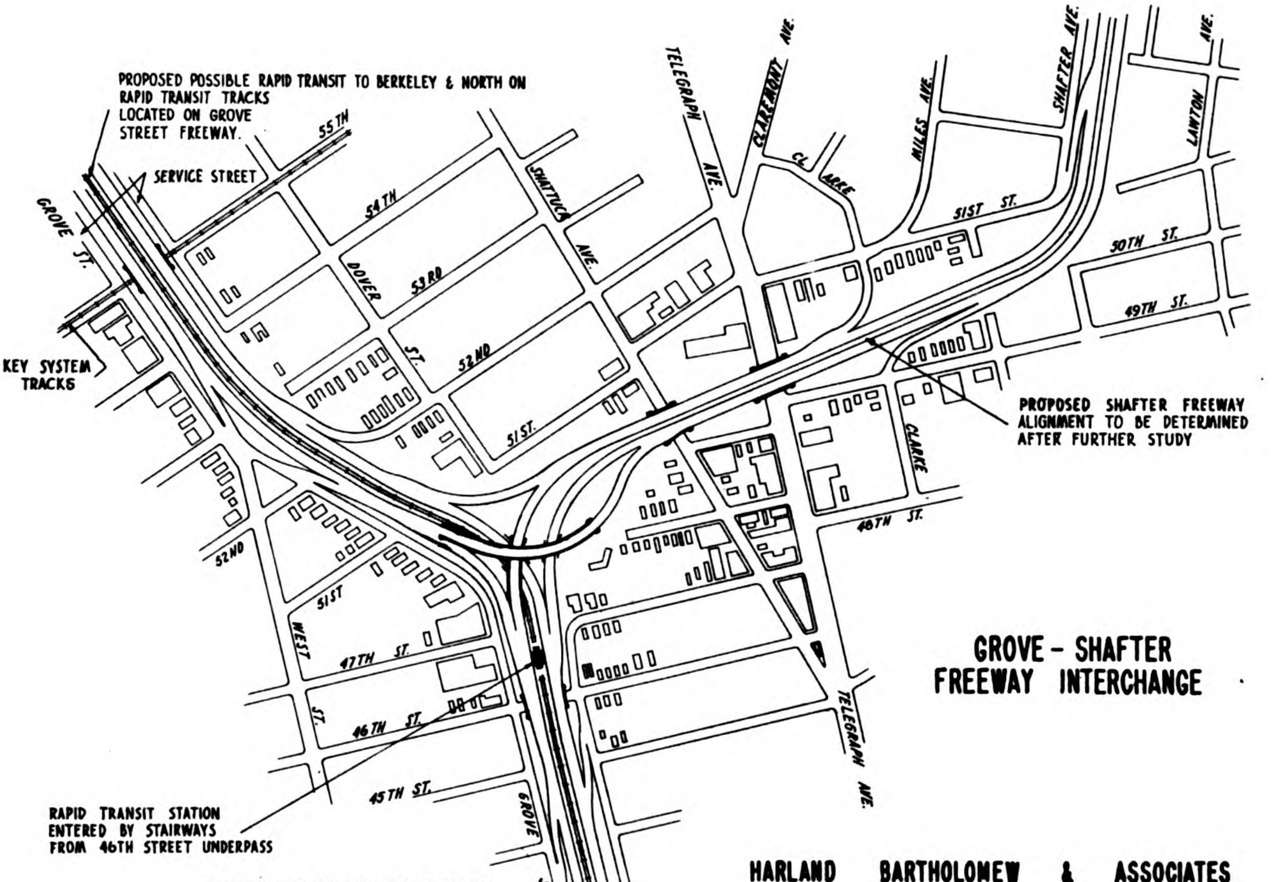
NEW MACARTHUR FREEWAY

SERVICE STREETS

WHEN PROPOSED TRACKS ARE INSTALLED RAPID TRANSIT STATION LOCATED ON THE FREEWAY OVERPASS WOULD HAVE STAIRS TO STREET LEVEL BELOW AND SERVE THE GRAND-LAKE AREA

SERVICE ROAD GOES UNDER OVERPASS ON EXISTING STREET TO CONNECT WITH GRAND AVE.

GRAND - LAKE INTERCHANGE
MACARTHUR FREEWAY



PROPOSED POSSIBLE RAPID TRANSIT TO BERKELEY & NORTH ON RAPID TRANSIT TRACKS LOCATED ON GROVE STREET FREEWAY.

SERVICE STREET

KEY SYSTEM TRACKS

PROPOSED SHAFTER FREEWAY ALIGNMENT TO BE DETERMINED AFTER FURTHER STUDY

GROVE - SHAFTER
FREEWAY INTERCHANGE

RAPID TRANSIT STATION ENTERED BY STAIRWAYS FROM 46TH STREET UNDERPASS

PROPOSED POSSIBLE RAPID TRANSIT TRACKS TO FOLLOW GROVE STREET FREEWAY TO THE OAKLAND CENTRAL BUSINESS DISTRICT.

HARLAND BARTHOLOMEW & ASSOCIATES
· CITY PLANNERS ·

CHARACTER OF FREEWAY IMPROVEMENTS

As mentioned earlier in this report, urban freeways are expensive to build. The improvements must be well planned from the standpoint of traffic capacity, lane widths, sight distances, gradients and curvature, elimination of cross traffic by separation of grades at some cross streets and closing of intersecting streets at other locations, and ease of entry and exit where traffic interchanges are provided.

Within urban areas some attention should be given to the esthetic treatment of the freeways. Screen planting and landscaping of slopes and median strips will do much toward blending the freeway into the surrounding areas, particularly where the freeway traverses districts which are predominantly residential. Grade separation and traffic interchange structures should be designed with full esthetic consideration. The slight additional cost of these items is more than compensated for by the pride of a community in improvements which add to rather than detract from the appearance of the city.

Sketches showing the suggested treatment of grade separation and traffic interchange structures at several locations on the proposed freeway system are shown on Plate 12.

PROGRAM FOR THE FIRST TEN YEARS

The following projects are of vital importance to the Oakland Metropolitan Area and all possible efforts should be made toward their completion within the next decade. The order of listing is not intended to indicate the sequence of construction. Availability of earmarked funds, progress of right-of-way acquisition, and in some cases construction difficulties will govern the sequence of improvement of the various items.

Freeways

Completion of the Eastshore Freeway from the San Francisco-Oakland Bay Bridge distribution structure to Mt. Eden Road.

Construction of the interstate route from the Dublin Canyon Road (U.S. Route 50) to a connection with the Eastshore Freeway near San Lorenzo Village.

Construction of the MacArthur Freeway from the San Francisco-Oakland Bay Bridge distribution structure to High Street. Acquisition of right-of-way for this freeway east of High Street.

Acquisition of rights-of-way for the Grove-Shattuck and Shafter Avenue freeways.

Construction of a second subaqueous tube to Alameda paralleling the existing Posey Tube.

Major Streets

Improvement of the 12th Street Dam.

Extension of Alice Street to 20th Street.

Improvement of 26th Street-Bay Place from Grove Street to Grand Avenue

Improvement of East 12th Street from 12th Avenue to Fruitvale Avenue.

Widening and improvement of 22nd Street.

Improvement of San Leandro Boulevard from High Street to 98th Avenue.

Improvement of Mountain Boulevard from Broadway to MacArthur Boulevard, near San Leandro.

Construction of the 42nd Avenue connection from High Street to the Eastshore Freeway.

Construction of Richmond Boulevard from 26th Street to Pleasant Valley Avenue.

Widening and improvement of Foothill Boulevard from Lake Merritt to High Street.

Acquisition of right-of-way for the improvement of Park Boulevard.

In addition to the above the following projects were included for post-war construction in the 1945 City bond issue.

Market Street extension from Adeline Street to Sacramento Street at the Oakland-Berkeley city limits.

McAdam Street from Mather and Montgomery Streets to Broadway.

Park Boulevard from Excelsior Avenue to East 38th Street.

14th Avenue from East 14th Street to MacArthur Boulevard.

ACCOMPLISHING THE PLAN

The chief purpose of the Major Street and Freeway Plan is to provide for the people of Oakland a comprehensive pattern of thoroughfares which will be needed to carry the future traffic movements in Oakland and adjacent areas. The traffic problem is a community problem. It is not to be solved by temporary expedients or by waiting for local demands.

The present designation of streets of major importance as agreed between the City and the State Division of Highways for the allocation of State gasoline tax refunds to street maintenance and improvement should be immediately correlated with the proposed major street plan.

The State Deficiency Program as approved by the Legislature will provide State assistance for the improvement of a number of the traffic arteries included in the Plan. Approximately $685,000 will be available to the City of Oakland during the fiscal year ending June 30, 1948, and the State estimates that gasoline tax refunds will amount to about one million dollars each year thereafter. In addition, there are County funds obtained from State gasoline taxes which may be used for city streets and important roads, and State and Federal funds available for interstate routes as well as highways within cities.

The necessity for continuous planning cannot be overemphasized. In 1927, a Major Street Plan for Oakland was prepared under the sponsorship of a committee of civic leaders. This Plan recommended an extensive program of street widening and the opening of new streets and connections between existing streets to provide a network of thoroughfares to serve an Oakland population of approximately 420,000 in 1945. (The 1945 special census showed a total population for Oakland of 401,000.) Many of the improvements recommended in the 1927 plan have been carried out during the intervening twenty years.

Since the 1927 study, the growing importance of Oakland and the East Bay as a commercial and industrial area has developed new problems in traffic flow. The concept of urban freeways, coupled with the widespread ownership and usage of automobiles and trucks in the Bay area have brought about changes in the details of major street design, but have not changed the fundamental principles of major street systems. For example, two decades ago, nine foot traffic lanes provided adequate width for vehicular movement. Today, eleven or twelve-foot lane widths are required where an appreciable proportion of the traffic is composed of trucks with the body widths and heights permitted in California. Now, traffic volumes, speeds, and time delays will justify construction of expensive grade separations at intersections of major thoroughfares within cities, whereas in 1927 the same traffic and the same time delays would not have been considered of sufficient importance to justify separations.

In Oakland the provision of a system of well coordinated major traffic arteries is a primary necessity. It will give the city a greater vitality and will be available to serve the future growth of the community. It is not necessary nor intended that all the proposals made in this Report be carried out at once. But there must be a policy of aggressive street and freeway improvement based upon this plan.

Upon the adoption of this Freeway and Major Street Plan as a portion of the Master Plan for Oakland, the City should critically review the streets upon which setback lines have been established and an expanded program should be evolved and setback lines established over the maximum mileage of major streets which can be protected within the limits of available funds. This action now will protect the public against excessive right-of-way costs at the time street widening and improvement projects are carried out.

There should be a complete and continuing interchange of information on all street improvement matters between the various departments in the City government and between the City and adjacent communities as well as the County officials. Such cooperation will assure that matters of right-of-way acquisition, street widening or improvement, traffic problems, etc., will receive proper attention and can be fitted into the long-range plan.

The adoption of this Freeway and Major Street Plan will provide a carefully considered program for bettering the present and future traffic problems of Oakland and its metropolitan area. Any improvements made according to the Plan, even though they be minor ones, will ultimately tie together with other improvements to bring the Plan nearer to completion. It is expected, however, that certain revisions and additions may be necessary in the future due to changing conditions. These necessary revisions, based on sound planning principles and made with the interchange and cooperation of the various governmental offices as outlined previously, will keep the Plan up to date and improve its proposals for the future.